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GROCEER'S DIGITAL RECEIPTS PAY OFF

Project yields improved back-office integration

BY CAROL SLIWA

Smart & Final Stores Corp.'s IT department last night went live with the final systems in a trailblazing one-year project to bring digital receipts to its small-business customers.

But the Commerce, Calif.-based warehouse grocery chain's back-office IT systems stand to benefit even more than customers who lose their paper receipts. Point-of-sale data will now be channeled through one server for use by multiple ap-

plications, addressing a long-standing integration headache and paving the way for near real-time access to data.

Before, Smart & Final had relied on 18 interfaces feeding its IBM S/390 mainframe and needed many more interfaces to extract data for use by various applications, such as the accounts receivable and sales audit systems, said Avraham Isaacs, vice president of development.

“It was just really complex,” said Zeke Duge, CIO at Smart & Final. “The data that accounting had looked different than the data that marketing had,

Digital Receipts, page 14

JAMES YANG

UPS, FEDEX PICK EURO STANDARD

Package carriers snub U.S. wireless approach

BY BOB BREWIN AND
LINDA ROSENCRANCE

Ignoring the CDMA standard being pushed by U.S. vendors, two giant U.S. package carriers have adopted a European-developed approach for new global wireless services.

United Parcel Service Inc. and FedEx Corp., wireless pioneers and two of the largest users of mobile wireless data

Wireless, page 14

SPEED CONTEST

Wireless Fight: GPRS vs. CDMA

GPRS, a European standard

- 20K to 40K bit/sec. data rate

- Up to 150K bit/sec. within one to two years

■ U.S. carriers include AT&T Wireless, Cingular Wireless and VoiceStream Wireless

CDMA 1x, pushed in the U.S.

- 50K to 70K bit/sec. rate today

- 60K to 80K bit/sec. data rate by January 2003

■ U.S. carriers include Sprint PCS and Verizon Wireless



RIDING HERD ON Risk

COMPANIES THAT buy and sell commodities or financial instruments are encouraging the use of sophisticated systems to help organizations calculate and manage their risk. The emergence of powerful computers, deep data warehouses and modern analytical tools have made reporting risk in close to real time a possibility. And some companies are using the information for big payoffs. **SEE PAGE 24.**

FEDS' LOT IS CAST WITH WORLDCOM

*Move to new provider
would incur huge costs*

BY PATRICK THIBODEAU
WASHINGTON

The U.S. government may be the world's largest user of WorldCom Inc. services, paying the company \$462 million a

year for a vital telecommunications infrastructure to support the Department of Defense, the Justice Department and other key agencies.

So when WorldCom CEO John Sidgmore came to Washington last week to meet with regulators, he was also here to assure government officials

that the services would continue without interruption.

But even if those officials felt compelled to switch providers, the obstacles to doing so would be formidable. As is the case in the private sector, WorldCom's contracts with the government impose penalties for making an early exit. And the cost of moving to a new provider is high.

WorldCom, page 53

“There is no reason
for any individual
to have a computer
in their home.”

1977

“640K ought
to be enough
for anybody.”

1984

“Portal,
schmortal.”

2002

(Pooh-pooh it now, while you still can.)

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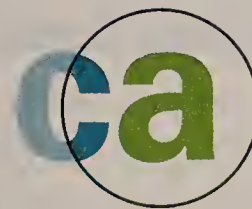
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"Any to any" connectivity

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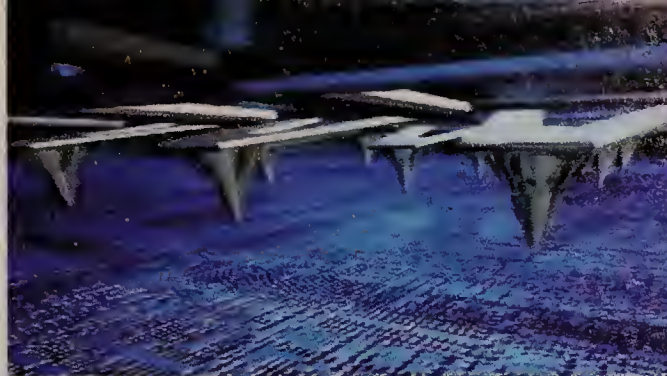




POLLY BECKER

WATCHING WORKERS: THE DO'S AND DON'TS

Increasingly sophisticated monitoring tools produce lots of data on worker productivity. The key is combining this information with other performance indicators. **PAGE 38**



INCREDIBLE SHRINKING STORAGE MEDIA

The density of magnetic storage media is increasing at a rate that has made it possible to store 25 billion pages of data on a chip the size of a postage stamp — while storage prices continue to drop. **PAGE 30**

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COMPUTERWORLD THIS WEEK

NEWS

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6 IBM announces plans to enable its mainframes to host applications on “virtual servers” running Linux.

7 With its narrow focus on Windows, Microsoft’s new J# .Net tool may have a limited uptake among developers.

8 Security experts warn that it’s only a matter of time before a major U.S. corporation is hit with a combined physical and cyber-terrorism attack.

10 IT shops find that their asset management responsibilities are being extended beyond hardware and software.

12 EDS backs away from outsourcing talks with Procter & Gamble, citing cost issues.

BREAKING NEWS

For breaking news, updated twice daily, visit:

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TECHNOLOGY

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24 Companies are using a wide range of sophisticated software systems and tools to understand and manage the risks they face.

26 Wireless LANs and content caching are on the front burner at General Motors, says Tony Scott, the automaker’s chief technology officer.

32 QuickStudy: Chip fabrication, the process by which multibillion-dollar plants turn common sand into complex integrated circuits, is the topic of this week’s primer.

33 Emerging Technologies: Server blades use less power and take up less space than earlier products, and emerging standards should help speed adoption, say proponents of the technology.

34 Security Journal: Vince Tuesday’s new, secure remote-access system is hijacked by the marketing department.

MANAGEMENT

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37 Bart Perkins says the first step to better control of procurement processes is establishing a baseline of data on IT suppliers and the way you buy products and services.

40 Mitsubishi Motor Sales is relying heavily on IT to shift its customer focus into high gear, integrating software from 18 vendors so far, with more projects down the road.

42 The construction industry has traditionally been a technology laggard. But that’s starting to change as more companies embrace wireless and Web technologies.

44 Boston doctors warm up to a knowledge management system that has helped reduce medication errors by half.

47 Career Adviser Fran Quittel counsels a software developer looking to move into quality assurance and an experienced network administrator who has been jobless since April.

OPINIONS

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20 Patricia Keefe argues that now is an ideal time to strike a blow for vendor independence, because so many of the leading IT providers are in disarray.

20 Pimm Fox says a Silicon Valley firm brings technology advances and simplicity to wireless e-mail by offering software and services without proprietary hardware strings.

21 David Moschella writes that the scandals of Enron, WorldCom and other IT-intensive companies are eroding investor confidence and will slow a recovery in the IT industry.

54 Frank Hayes has two words for a congressman’s attempt to allow copyright holders to maliciously hack into your computers: *really awful*.

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PRICING RISK

One Midwestern insurance company says it will insure anyone — for the right price — thanks to its risk management system. Read about how the firm does it.

QuickLink: 31017

BOTHERED BY BUG REPORTS

In the wake of a recent study that said software bugs cost the U.S. economy close to \$60 billion each year, IT pros are asking how they can keep the bugs out of software. Join the discussion in our online forum.

QuickLink: a2280

WHAT'S A QUICKLINK?

On some pages in this issue, you’ll see a QuickLink code pointing to additional, related content on our Web site. Just enter that code into our QuickLink box online, which you’ll see at the top of each page on our site.

Use QuickLinks to see related stories, discussion forums, research links, archives and more.

AT DEADLINE

California Disbands
IT Oversight Agency

The agency that had oversight responsibility for the California state government's IT spending was shut down, as expected [QuickLink: 29291]. Gov. Gray Davis ordered individual agencies to take back the duties that had been handled by the California Department of Information Technology. The IT unit was done in by its role in a controversial Oracle database contract.

Linux Vendor Passes
On UnitedLinux Effort

MandrakeSoft SA, a Paris-based Linux operating system vendor, announced that it won't join the UnitedLinux initiative launched in late May by four rivals [QuickLink: 30239]. MandrakeSoft said it wouldn't gain anything by joining UnitedLinux, because it has a higher market share than three of the four vendors involved in the plan to offer a uniform Linux distribution.

Compuware Says Q1
Results to Miss Target

Compuware Corp. warned that financial results for its first quarter ended June 30 will be below expectations, the second straight quarter in which the Farmington Hills, Mich.-based company has fallen short of projections. Other software vendors that issued similar warnings last week included Rational Software Corp. in Cupertino, Calif., and webMethods Inc. in Fairfax, Va.

Microsoft Judge OKs
Settlement Process

The judge reviewing the proposed antitrust settlement between Microsoft Corp. and the U.S. Department of Justice said both sides complied with a federal statute that governs such deals. Critics had charged that Microsoft didn't disclose all its interactions with government officials.

IBM to Host Linux 'Virtual Servers' on Its Mainframes

Partitioning technology built into zSeries isolates applications run by different users

BY TODD R. WEISS

IBM LAST WEEK announced a plan to create "virtual servers" for corporate users connected to mainframes running in its data centers, provided that the users are willing to run applications on a Linux operating system.

The Linux Virtual Services offering takes advantage of a virtual partitioning technology that's built into IBM's zSeries mainframes. IBM said it will partition processing, storage and network capacity for multiple virtual server users on zSeries machines, isolating applications to provide the same level of separation that companies would get in setting up their own physical systems.

Applications can be hosted on mainframes running Version 7.2 of Nuremberg, Germany-based SuSE Linux AG's Linux distribution at IBM's 170 data centers around the world. Pricing will be based on IBM's "service unit" formula, which takes into account the amount of processing resources being used and data center costs such as power and floor space.

Warren Hart, director of e-business-on-demand operations at IBM, said the hosting service will save companies about 30% of the cost of running Windows NT or 2000 servers. Users will also be able to quickly expand their processing capacity and run peak workloads without having to buy hardware that won't be used most of the time, he said.

Amy Wohl, an analyst at Wohl Associates in Narberth,

Pa., said buying a mainframe is an expensive and often difficult decision for many companies. IBM's virtual server capability "is making that a much easier decision," she said.

Letting users run Linux applications as though the software were on their own dedicated servers also gives companies more flexibility, Wohl said. The only problem, she noted, is that it's unclear how much interest there will be in the virtual server idea. "We don't really know what the demand is for that now," she said.

Michael Prince, CIO at clothing retailer Burlington Coat

IBM's Linux Utility

Key details of the Linux Virtual Services offering:

HARDWARE: IBM zSeries mainframes located in 170 data centers

OPERATING SYSTEM: SuSE Linux 7.2

COST: \$300 a month per "service unit," a new pricing formula used by IBM

PROMISED SAVINGS: About 30% compared to Windows NT/2000 servers

Factory Warehouse Corp. in Burlington, N.J., said IBM's new offering is innovative. "I think it's creative what they're doing," he said, adding that the

idea also shows the potential viability of Linux in business computing applications.

But Burlington Coat Factory, which uses Linux on more than 1,250 servers in its 250 stores, wouldn't be interested in the virtual server offering, according to Prince. He said the service is more likely to appeal to existing IBM mainframe users.

IBM plans to provide application porting services to companies that aren't currently running Linux-based systems.

Bruce Caldwell, an analyst at Dataquest Inc. in San Jose, said IBM is also putting an emphasis on computing as a utility. The Linux virtual server offering "should appeal to IT organizations that need to cut costs, and that's a pretty large group at this point," he said. ▀

Intel Readies Itanium 2 Chip for High End

New processor runs up to three times faster than original

BY JENNIFER DISABATINO

Intel Corp. today plans to release the second version of its 64-bit Itanium processor, in another attempt to break into the market for high-end servers and workstations.

Brian Cox, worldwide product line manager for Itanium products at Hewlett-Packard Co., said the Itanium 2 should perform up to three times faster than the first version of the chip, which was released in June last year [QuickLink: 20816]. HP and Intel jointly developed the two processors.

Intel may have trouble changing perceptions because of the relatively limited market acceptance of the first Itanium. For example, Dell Computer Corp. said it won't launch new

Itanium-based servers until it sees more demand from users.

But several users and analysts said Itanium 2 should be a big improvement for Intel.

With the first Itanium, "we found that the memory bandwidth was somewhat constricting to us," said Tony Elam, associate dean of engineering at Rice University in Houston. Itanium 2 is a "significant" step forward, he said.

Listening to Users

Charles Rice, an analyst at The Sageza Group Inc. in Mountain View, Calif., said the improvements that Intel has made in Itanium 2, including a larger memory bandwidth, suggest "that the company is actively listening" to users.

Cox said HP today plans to announce two servers and a pair of workstations based on Itanium 2. All of the systems can be ordered now and are due to ship late this month or in early August.

A spokesman for IBM said the company plans to release a server equipped with the new chip by year's end. Blue Bell, Pa.-based Unisys Corp. said it will detail its Itanium 2 server plans later this month, although it will announce today a program for migrating users of its ES7000 systems to Microsoft Corp.'s 64-bit SQL Server 2000 database.

The U.S. Department of Energy's Pacific Northwest National Laboratory in Richland, Wash., has been testing an Itanium 2-based HP Linux server with four processors since May 1. "It's incredible," said Scott Studham, group leader of the lab's molecular science computing facility. "We're sustaining 96% of peak theoretical performance." ▀

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For more news and information about Linux, please visit our Web site:

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Visual J# .Net Tool Expected to Have Limited Impact

Lacks support for key Java technologies

BY CAROL SLIWA

The Visual J# .Net tool that Microsoft Corp. launched last week isn't expected to have a huge impact on corporate IT departments using Java, analysts said.

Visual J# (pronounced "J-sharp") will allow developers to write applications using the Java language syntax, but those applications will be able to run only on Microsoft's .Net framework and Windows operating system. So applications written with the Visual J# .Net tool won't be able to use key Java class libraries and Java 2 Enterprise Edition (J2EE) technologies, such as Enterprise JavaBeans, Java Server Pages and Java servlets.

Regardless, Microsoft has added Java to the list of more than 20 languages supported in its Visual Studio .Net development tool set, which shipped in February.

"This is fulfilling our philosophical belief that we support as many languages as possible on .Net," said Prashant Sridharan, a Visual Studio product manager at Microsoft.

Weighing the Pros and Cons

Microsoft recommends that its tools be used to build applications optimized to run on Windows. Developers who write applications for other operating systems are advised to connect them through XML-based Web services, which Microsoft is promoting heavily as the key to interoperability.

But part of Java's allure for developers has been its potential to run on a wide range of operating systems, so it remains to be seen how great an impact Visual J# will have on corporate IT departments.

"Microsoft was able to get a small amount of market share with its J++ tool, and those customers stand a great risk of seeing Microsoft abandon Java," said Simon Phipps, chief technology evangelist at Sun Micro-

systems Inc. "Microsoft is making a last-ditch attempt to migrate those customers over to the closed .Net environment, and now this tool is just a bridge for that very limited community. People who want to gain the true value of Java are using the open tools from the wide range of suppliers who stick to the Java standards."

A Microsoft spokesman predicted that 12% to 15% of all Java developers will use Visual J# .Net within a year. But Thomas Murphy, an analyst at Stamford, Conn.-based Meta Group Inc., said that's unlikely, because some users distrust Microsoft in the Java space.

"If, in the future, 15% of the Java market was J#, it would only be because Microsoft customers have migrated from

other languages, rather than anyone from the Java community going the other way," Phipps predicted.

Kimberly Martin, a systems engineering specialist at Fireman's Fund Insurance Co. in Novato, Calif., said her company has no plans to use Microsoft's new Java tool. Most of Fireman's Fund's Java applications run on IBM's AIX operating system, and its developers

use IBM's Java tools, she noted.

"We're not looking to depart from J2EE. We have a lot of investment in that," Martin said, adding that her company isn't bringing in much new technology right now. Martin said Fireman's Fund does have a minor amount of Java applications running on Windows NT, but it hasn't moved to .Net and would need a business requirement to do so.

Sharp Object

KEY FEATURES OF MICROSOFT'S VISUAL J# .NET TOOL:

- Integrated with Visual Studio .Net development environment
- Designed to use .Net framework
- Includes tools to automatically upgrade and convert existing Visual J++ 6.0 projects to Visual Studio .Net format

COST: Standard edition of Visual J# .Net sells for \$109; professional edition of full Visual Studio .Net tool set costs \$1,079, or \$549 for an upgrade

SOURCE: MICROSOFT CORP.

Online Aggregation Failing To Deliver ROI for Banks

Privacy a top customer concern, study finds

BY LUCAS MEARIAN

Most financial services firms with online aggregation services should cut their losses and shut them down, because customers' privacy concerns have resulted in slow adoption rates and, in turn, a lack of ROI, industry analysts say.

Forrester Research Inc. in Cambridge, Mass., published a report last week that says only 1% of U.S. and 1.5% of Canadian online households used aggregation services in the first quarter of 2002. Aggregation is the pooling of a customer's accounts from various institutions onto a single Web page for more comprehensive financial planning and ease of use.

The promise of aggregation was the opportunity to cross-sell products to customers us-

ing information gleaned from their various accounts and to sell online financial planning tools and advice.

But according to Forrester and other research firms, few customers are willing to share passwords and personal identification numbers to access a competing firm's accounts because of privacy concerns.

"If you're trying to sell it to a target audience that doesn't participate, what's the point?" asked David Furlonger, a financial services analyst at Gartner Inc. in Stamford, Conn.

The vast majority of banks use application service providers such as Yodlee Inc. in Redwood City, Calif., S1 Corp. in Atlanta and CashEdge Inc. in Milpitas, Calif., to host their aggregation sites. Yodlee is the clear leader, with an 80% market share.

Yodlee acknowledged that only 44% of its enrolled aggregation customers are active but said that number is misleading if taken out of context. Yodlee also said it recently renewed the contracts of five of its top banking and brokerage clients.


Mike Gilpin, an analyst at Cambridge, Mass.-based Giga Information Group Inc., said Microsoft's new Visual J# .Net tool may interest developers who formerly used the software maker's Visual J++ tool to write applications designed to run in a Microsoft environment. He said most developers who used Visual J++ to build standard Java applications have moved to other tools.

Gilpin predicted that Java developers who write applications that require strong graphical user interfaces may consider using Visual J# .Net to write the front ends of their applications, which largely run on Windows.

But Murphy cautioned that developers will need to learn the new .Net framework to work with Visual J# .Net. ■

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JUST THE FACTS

Banking on Aggregation

Points to consider:

- Aggregation costs \$8 to \$12 per year for each enrolled customer.
- Only a handful of big banks have the deep pockets needed to drive aggregation ROI.
- Companies should re-evaluate aggregation vendors, considering those that specialize in standardizing aggregated data.
- Companies should integrate aggregation into their online account platforms.
- Financial advisers should drive adoption by selling aggregation services to affluent clients.

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

"Online banking has about a 30% active-customer rate. Forty-four percent in the online world is pretty good," said Jim Taschetta, chief marketing officer at Yodlee. He said the Forrester report ignores recently released business intelligence tools that allow banks to use customer data to upsell and cross-sell.

Catherine Graeber, author of the Forrester report, said that even with tools like Yodlee's, "you get back to the problem of 'Do I have enough data to mine?'"

Palm Beach Gardens, Fla.-based VirtualBank, one of the earliest adopters of aggregation services from VerticalOne Corp. and Capital One Financial Corp., abandoned its aggregation plans because the ROI was almost nonexistent, according to Forrester.

"People would fall off and not use it farther down the road. When we cancelled it [five months ago], we got very few disgruntled customers," said Courtney McCashland, executive vice president of corporate development at VirtualBank. ■

Experts Predict Major Cyberattack Coming

Corporate icons could be targets; trillions of dollars worth of damage possible

BY DAN VERTON

A TERRORIST-sponsored cyberattack against major U.S. networks and businesses is no longer a question of if, but when and to what extent, according to former senior intelligence and security officials.

Although the laundry list of warnings surrounding possible

attacks has left people confused about what to prepare for, many experts with firsthand experience in counterterrorism said plans should be put in place to respond to a conventional bombing or chemical attack against a prominent private U.S. company, which would be followed closely by a cyber- or physical attack against regional communications and power systems to hamper rescue and recovery efforts.

A former senior intelligence official said companies considered American icons, such as General Electric Co., General Motors Corp. or IBM, could find themselves under siege.

The ex-official, who requested anonymity, said it's urgent that secure communications channels be established between CEOs of large multinational companies and government agencies such as local FBI offices.

Despite reports that Osama bin Laden has ordered the direct targeting of U.S. economic symbols, there has been no evidence to suggest that traditional terrorist groups have abandoned bombs and guns for computers, said Eric Shaw, a former CIA profiler who now works at Stroz Associates LLC, a cybercrime consulting firm in New York.

Plot Against Microsoft?

Global corporations, especially ones with ties to India or Israel, are big targets, Shaw said. In fact, he added, shortly after Indian authorities apprehended an al-Qaeda operative who warned of the December 2001 attack against the Indian Parliament, the suspect reportedly confessed to having knowledge of an infiltration operation against Microsoft Corp.

Microsoft spokesman Matt Pilla said the company hasn't been contacted by Indian authorities. But based on an internal security review and the various claims made by the suspect, the company doesn't consider the threat to be credible. However, Pilla said, Microsoft has beefed up both network and physical security around its corporate offices in the wake of Sept. 11.

Microsoft likely wouldn't be the only company targeted by so-called hackers for hire, experts said.

There are thousands of hackers capable of causing significant regional disruptions of the telecommunications and power grids as a way to amplify the effects of a physical attack, according to Stuart McClure, president and chief technology officer of Mission Viejo, Calif.-based Foundstone Inc.

"It's also safe to say that they have the blueprints for the networks," he said.

Jim Williams, director of security solutions at Omaha-based security services company Solutionary Inc. and a former member of the FBI's San

Channeling Uncertainty Into Action

WHAT THE EXPERTS RECOMMEND

1 Review and update disaster recovery plans.

2 Back up critical communication links. Some service providers will offer emergency-only redundant links at discounted rates.

3 Mirror critical business data in separate regional offices.

4 Review Web presence for content that could aid attackers or make you the target of an attack.

5 Review physical security. For large campuses/buildings, consider biometric or smart-card access controls for areas containing ventilation systems.

Francisco computer-intrusion squad, said the cyberthreats to the nation's telecommunications, power and emergency services systems are well documented. "These are not hypothetical vulnerabilities," Williams said. In fact, there have already been compromises that have risen to the level of an "immediate national security concern and response," he said.

A former director of one of the nation's major intelligence agencies, who requested anonymity, said a "red team" exercise in 1997 employing world-class hackers carrying out attacks aimed at degrading banking services showed that a real attack "could have done strategic damage to the money supply." The results of that study remain classified.

Two Fronts

But the former intelligence chief said a cyberattack conducted in conjunction with a major physical attack could "probably shake the foundation of the country" and lead to damages "in the trillions of dollars" (see story below).

Although he doesn't expect a cyberincident that security professionals haven't seen before, King Nelson, a CIO with Pittsburgh-based Tatum CIO Partners LLP, which provides companies with permanent, interim or project CIOs, said it's incumbent upon executives at large companies to plan ahead.

"Until now, my job was to provide an infrastructure and protect my company," said Nelson. "Now, I have to protect the country and the economy." ▀

MAKING THE NATION SAFER

The National Research Council has a plan for how to use IT to fight terrorism.

QuickLink: 31143
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The al-Qaeda Cyberfiles

PRESENT CAPABILITIES/INTENTIONS

- Internet connections outside Afghanistan are used to conduct planning and coordination.
 - Operatives use encryption and password-protected chat rooms with strict membership vetting.
 - Pro-Islamic and pro-bin Laden hacker groups – such as the Iron Guard and Unix Security Guards – are working in tandem.
 - Commercial software is used to map targets and identify infrastructure weaknesses.
 - Groups are actively seeking recruits to sabotage U.S. companies at home and abroad.
-
- ### WHAT THE FUTURE HOLDS
- Thousands of pro-bin Laden computer science students in India, Pakistan and the U.S.
 - Russian hackers for hire.
 - Major regional hacking attacks or virus outbreaks targeting power grid or telecommunications nodes in conjunction with conventional physical attacks.
 - Nuclear or chemical attacks targeting key economic nodes, such as Wall Street or telecommunications/power facilities.

SOURCE: CANADIAN OFFICE OF CRITICAL INFRASTRUCTURE PROTECTION AND EMERGENCY PREPAREDNESS

Exercise Exposes Vulnerabilities

Understanding the threats posed by cyberattacks against the nation's critical telecommunications, energy and emergency infrastructures has given way to learning about how failures in one industry segment can affect other sectors.

That was the conclusion of the Blue Cascades critical-infrastructure protection exercise that was held June 12 in Portland, Ore. A detailed action plan based on the results of Blue Cascades is scheduled to be completed this week.

The exercise was the second such regional critical-infrastructure protection exercise sponsored by the Pacific Northwest Economic Region, a public/private partnership created by five U.S. states and

three Canadian provinces. The first exercise, code-named Black Ice and held in Salt Lake City in November 2000, demonstrated how the effects of a major terrorist attack or natural disaster could be made significantly worse by a simultaneous cyberattack.

"Blue Cascades and Black Ice centered on prolonged power outages that were accompanied by natural gas infrastructure and telecommunications failures stemming from unknown causes," said Paula Scalingi, former director of the U.S. Department of Energy's Critical Infrastructure Protection Office and now a private consultant. Scalingi, who took part in both exercises, said response and

reconstitution of services was hampered by infrastructure interdependencies during both exercises.

The Pacific Northwest's infrastructure systems are highly integrated with Canada's. For example, more than 80% of the region's natural gas supply flows south from Canada through pipelines that are dependent on IT-based control systems, prompting a need for what state and local officials characterized as a multiyear effort to develop "a disaster-resistant region."

"Sept. 11 demonstrated that U.S. intelligence cannot provide the necessary alert and warning to prevent terrorists from striking," said Scalingi. Instead, it's up to regional officials to prepare "to deal with the unthinkable," she said.

– Dan Verton



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BRIEFS

Microsoft Fixes Bug In Windows Patch

Microsoft Corp. warned that a software patch issued last month to fix a security flaw in the Remote Access Service dial-up feature in several versions of Windows includes a bug that could prevent end users from making virtual private network connections. The company released a revised version of the patch and advised customers who applied the first patch to install the new one.

Network Associates Tries Again on Buyout

Network Associates Inc. launched a third bid to buy full ownership of its McAfee.com Corp. subsidiary in Sunnyvale, Calif., after dropping the first two offers because of accounting issues at Network Associates. McAfee.com's board said it would issue a recommendation about the offer this week. Santa Clara, Calif.-based Network Associates currently owns 75% of McAfee.com's stock.

CERT Warns of DNS Software Flaws

The CERT Coordination Center at Carnegie Mellon University in Pittsburgh said a buffer-overflow flaw in software that translates text-based Web addresses to numeric IP addresses could let attackers control systems. The flaw affects two versions of the Domain Name System (DNS) resolver library and should be fixed via upgrades, CERT said.

Short Takes

HEWLETT-PACKARD CO. said it will close a computer assembly plant in Swedesboro, N.J., that has about 300 workers. HP bought the plant as part of its acquisition of **COMPAQ COMPUTER CORP.** . . . Dallas-based software vendor **i2 TECHNOLOGIES INC.** warned that it expects to report a second-quarter pretax loss of more than \$85 million on revenue of about \$120 million.

IT Broadens Approach To Asset Management

Technology used to track plant floor devices and facilities as well as systems

BY THOMAS HOFFMAN

A NEW enterprise-wide approach to asset management is emerging in which IT organizations will be asked to look beyond their hardware and software to track plant floor equipment, facilities, real estate and other properties.

Although few companies have adopted what industry experts are referring to as total asset management (TAM) or strategic asset management, analysts and industry executives say that large manufacturers will lead the charge during the next year or two, with services firms and other industries following suit within a few years.

The shift to this more comprehensive approach is being driven in part by the proliferation of intelligent self-notifica-

tion technologies being built into plant floor equipment, said Houghton LeRoy, director of consulting at ARC Advisory Group Inc. in Dedham, Mass., which published a report on the topic last month.

The TAM approach will create more work for IT managers, but it could also let companies track, manage and depreciate all of their IT systems and other equipment more efficiently.

"The outcomes for strong performance and bad performance are the same, whether it's an offshore drilling platform that's not performing at capacity or you've lost track of several hundred PCs that you have under a lease," said Chip Drapeau, CEO of MRO Software Inc., an asset management software vendor in Bedford, Mass. "All have the same ramifications: You're leaving money on the

table and operating at standard service levels."

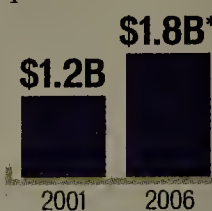
One MRO customer that's using TAM to improve its bottom line is Lockheed Martin Asset Solution Integration Services, a Titusville, Fla., division of Lockheed Martin Corp. that's tracking and managing assets for 12 NASA centers across the U.S. Under the 10-year deal that began in October 1998, Lockheed Martin is helping NASA track everything from radar dishes to forklifts.

Lockheed Martin has consolidated 26 work-control systems used to track equipment at each NASA facility into a unified Oracle-based data repository. By eliminating the need to support so many legacy systems, Lockheed Martin has helped NASA meet its head count and cost-reduction goals, said Gail Talbott, a program director at Lockheed Martin.

Among the key challenges Lockheed Martin faced were tagging the entire inventory of equipment from all 12 space

Keeping Track

Most of the growth in the enterprise asset management market will be driven by application service providers, Web-hosted services and electronic maintenance, repair and operations procurement.



WORLDWIDE MARKET FOR ENTERPRISE ASSET MANAGEMENT AND COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEMS

*Projected

SOURCE: ARC ADVISORY GROUP, DEDHAM, MASS.

centers and developing a common set of business rules for managers at each location to use. To help do that, Lockheed's team had its trainers work closely with NASA maintenance engineers to go over the requirements of each space center, said Talbott.

"Each center thought they had a unique way of managing assets," she said. "As it turned out, they pretty much tracked their assets the same way; they just used different terms." ▀

Indus Replaces CEO, Plans Cuts in New Turnaround Bid

Facing a drop-off in its sales, asset management software vendor Indus International Inc. last week announced the resignations of its CEO and chief operating officer and said it plans to follow with layoffs and other cost-cutting moves.

Atlanta-based Indus named Thomas Madison, chairman of its board since December, to replace Kent Hudson as CEO. Hudson is leaving along with COO Richard Beatty, whose position will be eliminated by Indus. The company also lowered its revenue forecast for this year from between \$135 million and \$150 million to \$125 million or less, citing weak IT spending in key vertical markets such as utilities

and mining.

Hudson, who joined Indus when it was having problems in early 2000, was credited with making the firm more user-focused [QuickLink: 23321]. Indus was profitable in the third and fourth quarters of last year, but it fell into the red again in this year's first quarter, due partly to a delayed project with the U.K.'s Ministry of Defense.

Jeff Babka, Indus' chief financial officer, said the company plans to restructure operations and reduce staffing in a bid to return to profitability in the fourth quarter. Babka said Indus will look at making cuts in its professional services group, which he described as overstaffed.

A cost-cutting plan is due to be disclosed Aug. 1, when Indus reports its second-quarter results.

Indus will now focus on running more efficiently, said Madison, but he added that the changes should not affect users or the company's software development efforts. Indus will also put more emphasis on marketing, Madison said. For example, it's trying to appeal to new users by offering its flagship Passport enterprise asset management software in a Web-hosted format.

Marc McCluskey, an analyst at AMR Research Inc. in Boston, said Hudson succeeded in tying users back into the product development process at Indus. But the new man-

agement's primary task will be to stabilize the company once again, McCluskey said.

Indus isn't the only asset management vendor facing difficult times. San Diego-based Peregrine Systems Inc. last month announced plans to cut 1,400 of its 2,900 workers in North America, the latest in a series of restructuring moves triggered by the discovery of accounting errors at the company [QuickLink: 30052]. However, Peregrine's problems are different from the ones Indus faces, said McCluskey. Peregrine has done a good job of focusing on its core technologies but was waylaid by the revenue-recognition problems that it uncovered, he said.

— Marc L. Songini

JANUARY 2000: Kent Hudson replaces William Grabske as CEO following an earnings restatement for Q3 1999.

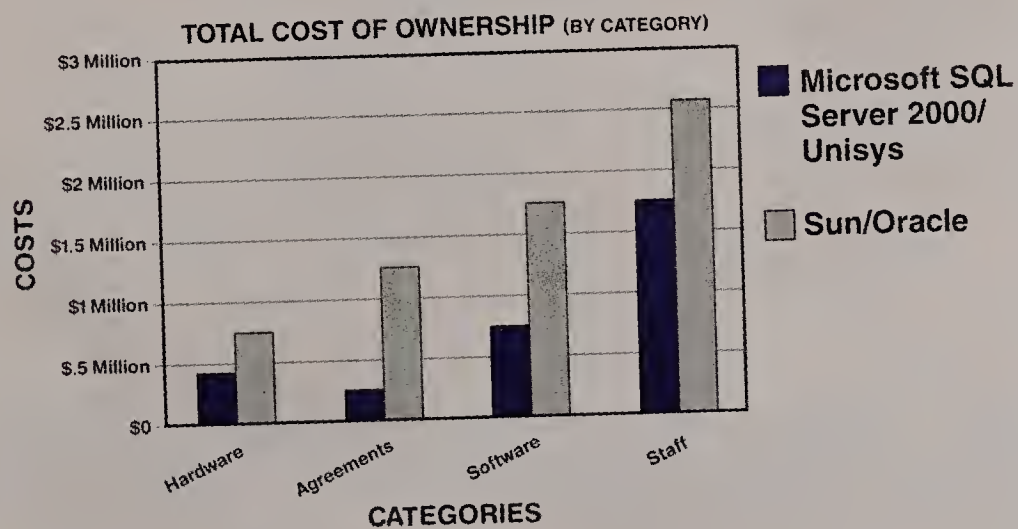
OCTOBER 2000: Indus pays \$4.3 million to settle a class-action shareholder suit stemming from the 1999 restatement.

OCTOBER 2001: Indus returns to profitability after losing money for seven straight quarters.

APRIL 2002: The company reports a first-quarter loss of \$9.5 million on revenue of \$32.4 million.

Figure 6

The Microsoft® SQL Server™ 2000/Unisys BI solution offers \$3.2 million in savings compared with the Oracle/Sun system over a five-year period.



We discovered that the current state of Windows® and Intel solutions offers considerable savings and an attractive alternative to the classic RISC/UNIX solutions for BI implementation.

Source: Walklett Group, February 2002

Social Security Number Usage Law Raises IT Uniformity Issues

Calif. legislation could prompt federal laws

BY PATRICK THIBODEAU

A CALIFORNIA law that took effect last week limits the disclosure of Social Security numbers, forcing businesses to remove this ubiquitous identifier from forms sent to customers and from correspondence and ID cards.

The law, which applies to any company doing businesses in California, is in the vanguard of legislation targeting identity theft. It could affect business practices nationwide and spur the passage of new federal and state laws.

"We don't have California-only systems," said Kirk

Hearth, chief privacy officer at Columbus, Ohio-based Nationwide Financial Services Inc. Hearth said it was much easier to apply the California rule nationally than to segment customer data by state.

The law is meant to make it harder for thieves to get a hold of this crucial identifier. The Federal Trade Commission said in 1999 that it received about 450 complaints per week from possible victims of identity theft; by the end of last year, the number had soared to 3,000. The Social Security Administration last year reported some 65,200 allegations of Social Security number misuse, up from 11,000 in 1998.

Companies had relatively little time to comply with the law, which was adopted in October.

The law prohibits including a person's Social Security number on any correspondence to him unless the law requires it. It also requires using encryption if the number is transmitted over the Internet.

Nationwide spent about \$130,000 to comply with the law, Hearth said. Although it removed Social Security numbers from some customer correspondence, Nationwide also used other techniques to hide the numbers. One involved using an algorithm that takes a key to decrypt, while another hides the first five digits of Social Security numbers.

Another technique used by other companies involves including the Social Security

number in a bar code, an industry group official said.

Congress has nearly a dozen bills pending that would restrict the use of Social Security numbers. One that would prohibit anyone from selling or displaying a Social Security number without the cardholder's consent is seen as the leading measure, but Congress isn't expected to act on any of the bills this year.

The risk for businesses is that a law could be adopted either in Congress or in another large state that sets different requirements from those in the California law, said John C. Scott, director of retirement policy at the American Benefits Council, an industry group in Washington that represents large financial services firms and other companies.

AT A GLANCE

SSN Security

Senators sponsoring bills that would set national laws on the use of Social Security numbers include the following:

JIM BUNNING (R-KY.) would prohibit the display of Social Security numbers on government checks and driver's licenses, among other restrictions (S 1014).


DIANNE FEINSTEIN (D-CALIF.) would prohibit the display, sale or purchase of Social Security numbers and give parties the right to sue. Her bill also includes civil penalties (S 848).

RICHARD SHELBY (R-ALA.) would prohibit the sale and purchase of numbers by financial institutions (S 324).

The question for businesses and industry groups "is whether they want to have a federal standard or whether they want to have this done state by state," said Scott. ▀

PRIVACY, PLEASE

For more stories about data privacy, head to the special focus page on our Web site:

 **QuickLink: s1200**
www.computerworld.com

EDS Abandons Outsourcing Talks With Procter & Gamble

Deal 'didn't make financial sense'

BY TODD R. WEISS

Electronic Data Systems Corp. last week took itself out of the running for an IT and business process outsourcing deal with Procter & Gamble Co. (P&G), leaving Affiliated Computer Services Inc. (ACS) as the only current contender.

EDS said it dropped out "after careful consideration of the overall transaction requirements and, more specifically, the acquisition price sought by P&G" for some of its back-office business operations.

A source familiar with the situation said the Cincinnati-based maker of consumer products has been searching for an outsourcing partner for

about 18 months and had recently winnowed the contenders down to EDS and ACS, a Dallas-based IT services vendor. ACS officials wouldn't comment on the matter, but the source said the company remains in the running for the P&G contract.

Laying Off 2,000

EDS's withdrawal was disclosed just a day before the outsourcing firm said it plans to cut 2,000 jobs because of the continuing slowdown in IT spending (see story at right).

But Dick Brown, chairman and CEO of EDS, said during a teleconference about the cutbacks that the decision to end the talks with P&G wasn't related to current market conditions or EDS's relationship with WorldCom Inc. WorldCom signed an 11-year, \$6.4 bil-

lion IT outsourcing contract with EDS in the fall of 1999.

EDS officials "are making the same financial decisions we would have made at any given point in time," Brown said, noting that withdrawing from the contract discussions with P&G wasn't easy.

"We had worked very hard over many months to win this piece of business," he said. "But at the end of the day, the

financial model, especially related to the acquisition cost, simply didn't make financial sense as structured."

P&G last month confirmed that it's seeking to outsource some of its business process functions and related IT operations in what is expected to be a major deal affecting up to 5,700 business and IT workers [QuickLink: 30634].

Linda Ulrey, a spokeswoman

for P&G, said officials there are still studying whether outsourcing is right for the company. She added that P&G hopes by year's end to set a plan on how to proceed and also choose an outsourcing vendor if it does decide to go ahead with a deal. ▀

Juan Carlos Perez of the IDG News Service contributed to this story.

EDS Blames IT Spending, Not WorldCom, for Job Cuts

The 2,000 jobs that EDS plans to cut represent about 1.4% of the company's 140,000-person workforce and are mostly held by employees in North America, company executives said last week.

Dick Brown, EDS's chairman and CEO, said during a teleconference that the workforce cutback is being driven by IT spending issues and not by the company's relationship with WorldCom. "It's related to contracts," he said. "Some of our clients have pulled back spending."

In addition to the \$6.4 billion IT

outsourcing contract that EDS and WorldCom signed three years ago, the two companies have a separate \$6 billion deal under which WorldCom provides telecommunication network services to EDS.

Analysts have voiced concern that the fallout from WorldCom's accounting improprieties could threaten both the revenue that EDS expects from the outsourcing contract and the services that it gets from WorldCom. But Brown tried to calm those concerns. "We expect our relationship with WorldCom to contin-

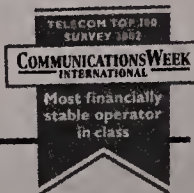
ue, and we've made it clear that we can manage any exposures if problems do develop," he said.

Despite the planned layoffs, Brown said EDS is still hiring people to work on some customer accounts and to work in specific markets. But the cuts aren't an extraordinary step, he added. "It's the same kind of action we've taken in the past and will likely take in the future," Brown said. "This is not unusual for our business."

— Juan Carlos Perez,
IDG News Service

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Continued from page 1

Digital Receipts

which would look different from this or that or the other."

IT executives knew they needed to improve the system. But, Duge said, it was tough to go to his executive committee and say, "Hey, guys, I want to change your data."

Then, Bob Graham, vice president of stores technology, told Duge about a new digital-receipt standard he had heard about at a National Retail Federation (NRF) conference. Digital receipts could help relieve some of the stress on Smart & Final's accounting department, which had to spend an "enormous amount of hours" ferreting out purchase histories for key customers, Graham said.

Duge took the digital-receipt proposal to the executives and said, "I can save real, honest-to-God, countable, touchable head count, and you can redeploy the assets into more efficient use."

"It juiced up the IT department," Graham said, "because we had the opportunity to do some things that others hadn't done before."

To make the digital receipts possible, Smart & Final had to put in middleware that could grab the information collected at its NCR cash registers, transform that raw data into the XML model approved earlier this year by the NRF's Association for Retail Technology Standards, and send it to its Microsoft SQL Server database.

Software from AfterBot Inc. in Norcross, Ga., takes that data and assembles it into the digital receipts, which customers can view via Web browsers. The receipts are composed internally and delivered via e-mail or fax, Graham said.

But it was the middleware piece, from Matra Systems Inc. in Duluth, Ga., that gave Smart & Final the flexibility to leverage its digital-receipt project to other applications. The middleware can unlock the raw data from the NCR point-of-sale systems and transform it into the format needed by not only the digital-receipt soft-

ware, but also by all of Smart & Final's applications.

"We wanted one single place where we can interpret the data," said Isaacs.

In the past, the data got interpreted at each store, and the flat ASCII files were moved at day's end to the home office's host system, where they were interpreted and processed again, Graham said.

Now, the data is fed in near real time to the Matra Freedom-Server, which runs on a Hewlett-Packard eight-way ProLiant server. In addition to improving data integrity, the system enables problems to be fixed just once, Isaacs said.

Now that Smart & Final has near real-time access to its point-of-sale data, the grocery chain can constantly feed its NCR Teradata warehouse, as well as offer digital receipts in its 230 stores. That gives the company the potential to view the effectiveness of promotions, measure customer satisfaction and deliver customized offers through cash registers, all in real time, Graham said.

"Hopefully, that will create brand loyalty for us," said Duge.

Continued from page 1

Wireless

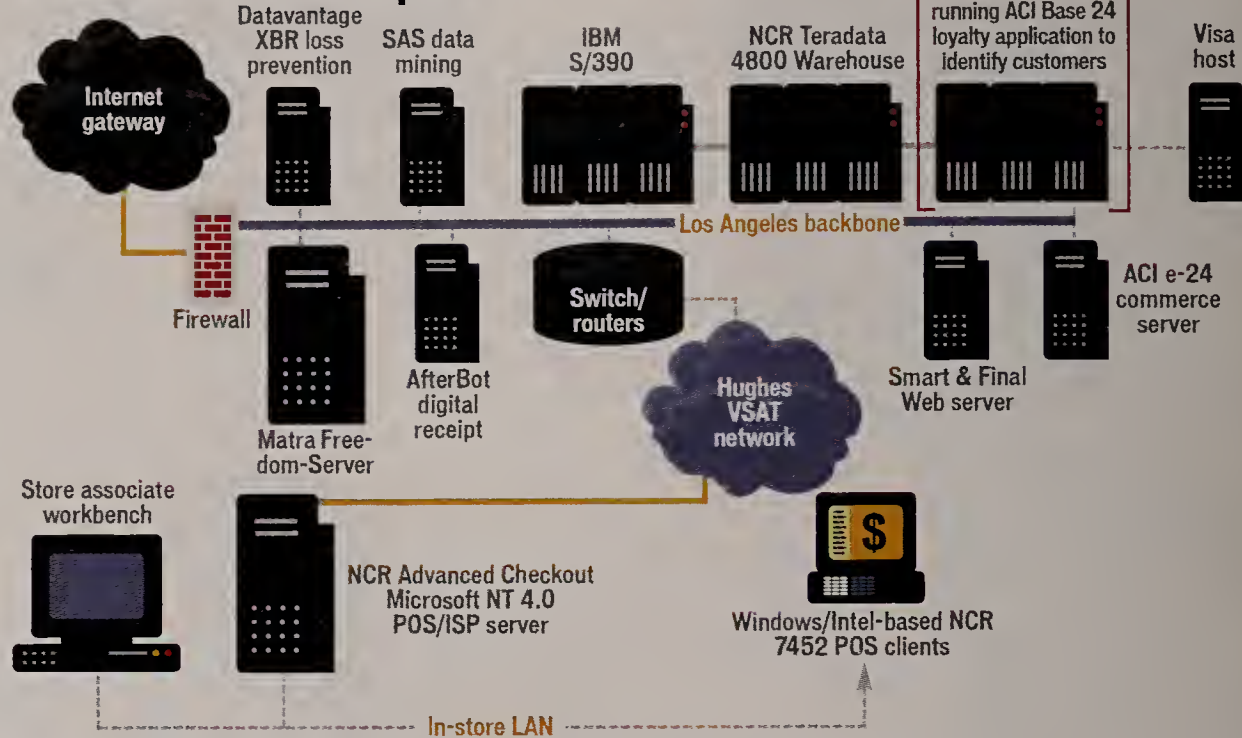
services, have both decided to standardize globally on IP-based General Packet Radio Service (GPRS), the next-generation version of the European Global System for Mobile Communications (GSM) standard, to support their pickup, delivery and package-tracking operations worldwide.

Susan Rosenberg, a spokeswoman for UPS, said the Atlanta-based company intends to standardize its mobile wireless tracking architecture on GPRS wherever it's available because the company believes standardization will "minimize our wireless communications costs and expand value-added services to our customers."

UPS intends to deploy GPRS service in the U.S., but Rosenberg didn't say when.

Memphis-based FedEx signed

Smart & Final Enterprise



SOURCE: SMART & FINAL, COMMERCE, CALIF.

Smart & Final IT executives said head count will remain roughly the same, because it gained responsibility for 52 more stores through acquisitions and store openings. They declined to provide project cost figures, noting that as an

early adopter of digital receipts, Smart & Final got special pricing that might not apply to other retailers.

Not every retailer will be able to justify a digital-receipt initiative, according to Peter Abell, an analyst at Boston-

based AMR Research Inc. Abell said digital receipts are "nice to have" for customer service and increased operating efficiency, but they're not a "must have" that would bring substantial payoffs in revenue increases and cost savings. ▀

a five-year deal with AT&T Wireless Services Inc. in March to provide GPRS service for its 40,000 U.S.-based couriers. Ken Pasley, FedEx's director of wireless systems development, said in an interview last week that his company is planning to roll out GPRS globally and is testing the technology in Europe.

"That's why we selected AT&T Wireless, because they have a global presence with wireless GPRS and GSM, and that allows us to have a single technology worldwide," he said.

However, Pasley added that FedEx might have to use other standards in areas not covered by GPRS, such as Qualcomm Inc.'s Code Division Multiple Access 1X (CDMA 1X) standard. Both Sprint PCS Group and Verizon Wireless use CDMA.

Last week, Motient Corp. in Reston, Va., said UPS had renewed a contract for Motient's non-IP-based mobile systems

for 57,000-plus UPS drivers in the U.S. Rosenberg said comparing the renewal of the Motient contract with UPS GPRS plans in the U.S. "is like comparing apples and oranges."

Ken Dulaney, an analyst at Gartner Inc. in Stamford, Conn., said that even as UPS moves forward with its GPRS plans in the U.S., the company will continue to use Motient to supplement GPRS in areas not served by the new, higher-speed technology.

UPS retrofitted 6,300 handheld devices used by its German drivers with GPRS modems this May and expects to have 11,000 GPRS handhelds in use in Western Europe by year's end, Rosenberg said.

UPS has already started to reap benefits from its GPRS network in Germany, which is provided by the T-Mobile International AG division of Bonn-based Deutsche Telekom AG, Rosenberg said, citing faster transmission times.

In the future, the network will also support voice as well as data, global roaming, video telephony and real-time emergency services, she added.

Craig Mathias, an analyst at Farpoint Group in Ashland, Mass., said that for large companies such as FedEx and UPS, standardizing on GPRS is "intuitively the right thing to do. It will simplify their business."

For companies without such a global presence, standardization isn't as much of an issue, Mathias added. But, he said, U.S. GSM/GPRS carriers such as Redmond, Wash.-based AT&T Wireless, Atlanta-based Cingular Wireless and Bellevue, Wash.-based VoiceStream Wireless Corp. (which is owned by Deutsche Telekom) will use FedEx and UPS as prime examples of why multinational companies should opt for an international standard.

A spokeswoman for San Diego-based Qualcomm had no comment. ▀

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Carlson Blends IP and Fibre Channel in Data Center SAN

Travel company cites savings from hardware, plans global expansion

BY LUCAS MEARIAN

CARLSON Companies Inc., a \$6.8 billion conglomerate that operates hotels, restaurants and travel agencies, this month is due to deploy what analysts said may be the largest storage-area network (SAN) that translates data between Fibre Channel and IP technologies.

The SAN, which could be completed as early as this week, has an initial storage capacity of 10TB. Minneapolis-based Carlson is using Internet Protocol for the core network within its data center and is relying on storage switches made by Nishan Systems Inc. to convert data from Fibre Channel to IP and back again.

The installation combines San Jose-based Nishan's IPS 4300 switches with a Hewlett-Packard XP512 disk array and a pair of redundant Cisco 6509 routers. Data is sent from Unix servers to Nishan's switches and then routed across the IP network to more Nishan devices, which are connected to the HP array (see box).

The hardware wasn't cheap. Carlson CIO Steve Brown said the 12 IP switches, two routers and 10TB array cost a total of about \$2 million. The company paid \$40,000 each for Nishan's switches, \$80,000 apiece for the Cisco routers and \$1.2 million for the XP512, he said.

But Carlson saved money by choosing IP instead of Fibre Channel as the central network protocol, because it was able to take advantage of its existing IT infrastructure and internal networking expertise, Brown said. Company officials expect those savings to grow as the SAN is fanned out to Carlson's global operations, he added.

"This all started out as a way

of reducing costs or optimizing our infrastructure cost," Brown said. "As you scale across the globe, which is our intent, the cost-reduction opportunities here are large." However, Brown said he hasn't calculated the project's potential return on investment.

A Storage Harbinger

Eric Sheppard, an analyst at IDC in Framingham, Mass., said Carlson's project is a harbinger of a wider move to merge Fibre Channel SANs and emerging IP storage networks. But the new SAN is less a direct challenge to Fibre Channel technology than it is

How It Works

CARLSON'S SAN PLAN:

■ **HP XP512 10TB** storage array is connected to four IPS 4300 Fibre Channel/IP switches from Nishan Systems.

■ **The Nishan switches** translate Fibre Channel control codes and data into IP packets for transmission to two Cisco 6509 Gigabit Ethernet routers.

■ **The Cisco routers** are connected to eight Nishan switches, which are paired to the front ends of four clusters of HP-UX and Sun Solaris servers.

an early example of how IP can be used in corporate storage applications, he said.

"This is far more of an integration of IP into the SAN, and that's significant," Sheppard

said. "It didn't occur to me that that was the sweet spot for IP — the high end. This is the data center. And that's striking."

Another notable aspect of the project is that Carlson overlaid a SAN template called the Shared Storage Model while designing its network. Brown said the company saved on development costs by using the template, which was created by members of the Storage Networking Industry Association in Mountain View, Calif.

Carlson began testing the SAN in February as a replacement for its direct-attached storage devices. The company is now connecting its servers to the network.

In addition to letting Carlson manage block-level storage transmissions as if they were IP data packets, the SAN was

designed to give the company the ability to link satellite offices around the world to its Minneapolis data center.

Such links are becoming a necessity for Carlson, which shares corporate-level data with offices in more than 140 countries and must ensure that their data is backed up.

"We have some offices with five or 10 people in them, and we're not convinced that backup is getting done and that recovery is possible," said Gary Johnson, an architectural consultant at Carlson Shared Services, the company's IT division. The best way to guarantee that backups take place is to replicate data from the remote offices to headquarters, he added, explaining, "Once it's in our data center, we can do regular backup routines." ■

MIXED MESSAGE

For more details about how Carlson is combining IP and Fibre Channel in its SAN, visit our Web site:

 **QuickLink: 30979**
computerworld.com

IBM Looks to Accelerate Mainframe Data Backups

Fibre Channel links to tie systems to virtual tape devices

BY LUCAS MEARIAN

IBM last week announced that its line of virtual tape storage devices will soon be able to connect disks used in data backup applications to mainframes via Fibre Channel links, potentially increasing data transfer rates by up to 75%.

The company also said it's upgrading its management software for the virtual tape servers, which look like tape drives to mainframes but record data onto disks to speed up the backup process. The data can then be downloaded off-line to tape silos.

In addition, IBM rolled out a

new model of its 3590 tape drive that can record 50% more data on tape cartridges than earlier versions. The 3590 Model H drive uses a new 384-track magnetic recording head, the company said. In comparison, IBM's older B and E models can write 256 tracks of data on a single cartridge.

IBM's Virtual Tape Server (VTS) B10 and B20 devices will get support for linking to mainframes through IBM's Fiber Connection channel attachment technology, which is based on Fibre Channel and referred to as Ficon. The technology supports peak data bandwidth of 100MB/sec., more than five times the 17MB/sec. ceiling for IBM's proprietary Enterprise System Connection channels.

The Ficon links are scheduled to become available in

September and are priced at \$150,000 for the underlying enablement technology, plus \$30,000 for each channel. A performance accelerator feature that lets the VTS controller use additional processors is due in January at a list price of \$100,000, IBM said.

Dianne McAdam, an analyst at Illuminata Inc. in Nashua, N.H., said the Ficon support will help reduce data backup times for mainframe users who

rely on VTS subsystems.

The upgraded management software is also a step forward for IBM, McAdam said. The company's virtual tape technology has lagged behind that of rival Storage Technology Corp. in Louisville, Colo., she said, adding, "This is IBM getting on the same level of what StorageTek had in the past."

IBM said the VTS Advanced Policy Management upgrade will support volume pooling, which lets storage administrators save similar data on a single group of tape cartridges. For example, if a company has customer data related to a specific business unit, that information can automatically be saved to one set of tapes, simplifying data archiving.

The software, which is scheduled for release in September, will also include a dual-copy feature that automatically creates two copies of data for disaster recovery purposes. The package has a list price of \$30,000 for new users; upgrades for existing VTS installations start at \$5,000. ■

AT A GLANCE

A Tape's Tale

Key facts about IBM's 3590 Model H tape drive:

STORAGE CAPACITY (regular cartridge): 30GB uncompressed, 90GB with 3-1 data compression

STORAGE CAPACITY (extended cartridge): 60GB uncompressed, 180GB with 3-1 data compression

DATA TRANSFER RATE: 14MB/sec

LIST PRICES: \$12,000 for upgrades from 3590 Model E

SHIPMENT PLAN: Available now; upgrade version to follow July 26

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Knowledge Management Users Pick Smaller Vendors

Lotus, Microsoft suites off to slow starts

BY JENNIFER DISABATINO

Deployment of the collaborative knowledge management suites that Microsoft Corp. and IBM's Lotus unit began promoting two years ago has been relatively slow, analysts said. That's giving smaller vendors a chance to develop knowledge management tools on their existing collaborative software offerings for users who are installing knowledge management software on an incremental basis.

Three of those vendors upgraded their tools last month (see box), making them more like the full knowledge management offerings from Microsoft and IBM. But several users said their deployments of the third-party tools were predicated on a specific function,

like document management.

For example, Peter Loupos, vice president of information systems for the drug innovation and approval group at Aventis SA, said the Strasbourg, France-based company uses software from eRoom Technology Inc. in Cambridge, Mass., to let teams of scientists in different countries track one another's research. Factors in eRoom's favor included out-of-the-box connections to portal software and document management tools sold by other vendors, but most important was ease of use, Loupos said.

"ERoom has what I like to call the Game Boy factor," he said. "You put it up there, point people at it, and they automatically know what to do with it."

Neither Microsoft and IBM's

Lotus Software Group subsidiary would disclose the number of licenses they have sold for their knowledge management products.

Antony Satyadas, business leader for knowledge discovery solutions at Lotus, said its Discovery Server software has a customer count "in the mid-hundreds," with anywhere from 250 to 20,000 end-user seats per deployment.

Microsoft claimed 5 million seats during the first 12 months that its SharePoint Portal Server was available, according to SharePoint product manager Trina Seinfeld. But she wouldn't say how many seats have been sold altogether.

David Ferris, an analyst at Ferris Research Inc. in San Francisco, said SharePoint sales have been light in comparison with Microsoft Exchange, which is licensed to about 100 million end users. The figure cited by Seinfeld "indicates that SharePoint is not going anywhere fast," Ferris said.

Mark Levitt, an analyst at IDC in Framingham, Mass., said changes that Microsoft

Three of a Kind

The following vendors announced upgraded collaboration and knowledge management tools last month:

OPEN TEXT CORP., WATERLOO, ONTARIO: Livelink Unite module for creating virtual workspaces for project teams, plus Livelink eSign for managing electronic signatures on documents

CORECHANGE INC., BOSTON: Multimode Collaboration Services software, which links to Groove Networks Inc.'s peer-to-peer tools and lets project leaders set up and manage information portals

TACIT KNOWLEDGE SYSTEMS INC., PALO ALTO, CALIF.: Tacit ESP 4.0 upgrade, which supports Microsoft and Oracle databases and includes preconfigured links to document repositories

and Lotus made in their marketing strategies are part of the reason for the relatively slow adoption rates. Lotus' K-station portal software was folded into IBM's WebSphere Portal Server last August. Likewise, Microsoft bundles SharePoint Team Services, which can be used to create online shared workspaces, with Office XP and Windows XP.

Lotus released Discovery Server 2.0 late last month with a redesigned user interface. Seinfeld said Microsoft plans to upgrade SharePoint Portal Server next year with a similar

goal of making it easier to use.

Ben Krutzen, who oversees information management at Royal Dutch/Shell Group of Cos. in Amsterdam, said Shell is expanding its use of Web-based document management software developed by Open Text Corp. in Waterloo, Ontario, to support knowledge management functions.

Documents are a key part of online meetings held by collaborative teams, Krutzen said, "so if you have a document management system already, then it makes sense to use it for knowledge management." ▀

World Cup Network Stays on Its Feet During Tournament

FIFA's converged net moved 12TB of data

BY MICHAEL MEEHAN

While much of the world was watching soccer during the month of June, Gerard Gouillou was monitoring data.

Gouillou, CIO at the Zurich-based Federation Internationale de Football Association (FIFA), which runs the World Cup soccer tournament, spent last month making sure the rest of the world could follow the games without a hitch. Between May 31 and June 30, when Brazil beat Germany 2-0 to win the quadrennial championship, 12.03TB of data moved across the network that was set up for the World Cup.

The converged voice and data network performed without major problems, according

to Gouillou. But the popularity of the World Cup games meant that he and FIFA's IT staffers had to keep a close watch on the network, which was built and maintained by Basking Ridge, N.J.-based Avaya Inc. [QuickLink: 29269].

For example, massive numbers of European fans followed the games in Japan and South Korea on the Internet, flooding the FIFA Web site. As of June 21, FIFA had logged 1.45 billion page views, with a one-day high-water mark of 127.9 million. "We didn't expect anywhere near that kind of Internet traffic," Gouillou said.

Meanwhile, the main media centers in Japan and South Korea generated far less network traffic than anticipated, he said. But the individual stadiums where the games took place generated much more traffic than FIFA expected.

World Cup Statistics

Total amount of data carried by FIFA's network during tournament: **12.03TB**

Peak amount of data transmitted over network in one day: **500GB**

Average transmission time for files between Japanese and Korean IT centers: **70 msec. during peak usage times**

One-day peak number of page views at World Cup Web site prior to the final game: **127.9 million**

"The one thing we had to change often was the way we were monitoring," said Gouillou. "You develop a model, but you cannot predict the way you have to monitor once everything starts."

Tools developed by Concord Communications Inc. in Marlboro, Mass., were chosen for the monitoring job, and Gouillou said much of his duties revolved around the information that was being provided by the software, especially by its predictive capabilities. "You want to know what will happen in the next minute, the next 15 minutes," he said. "The more reliant you get on that, the more addicted you get to it."

David Simpson, Avaya's vice president of international services, noted that the network was built to run far in excess of its expected peak capacity. That allowed the monitoring tools to be used more to anticipate network congestion than to troubleshoot crises. In fact, nearly 98% of the problems that FIFA's Web site encountered were resolved without any technicians having to be

dispatched, Simpson said.

Avaya reported that the network's packet-delivery rate for the tournament as a whole was 99.999% — the "five nines" reliability rate that's common in the telecommunications industry. Voice over IP phone traffic averaged about 100,000 calls per day, Simpson said.

The FIFA network was even able to withstand a one-day barrage of 400,000 e-mails that were sent by angry Italian fans after their team lost to South Korea in a controversial second-round game. "It turns out that the extra bandwidth we built in was our saving grace," Simpson said.

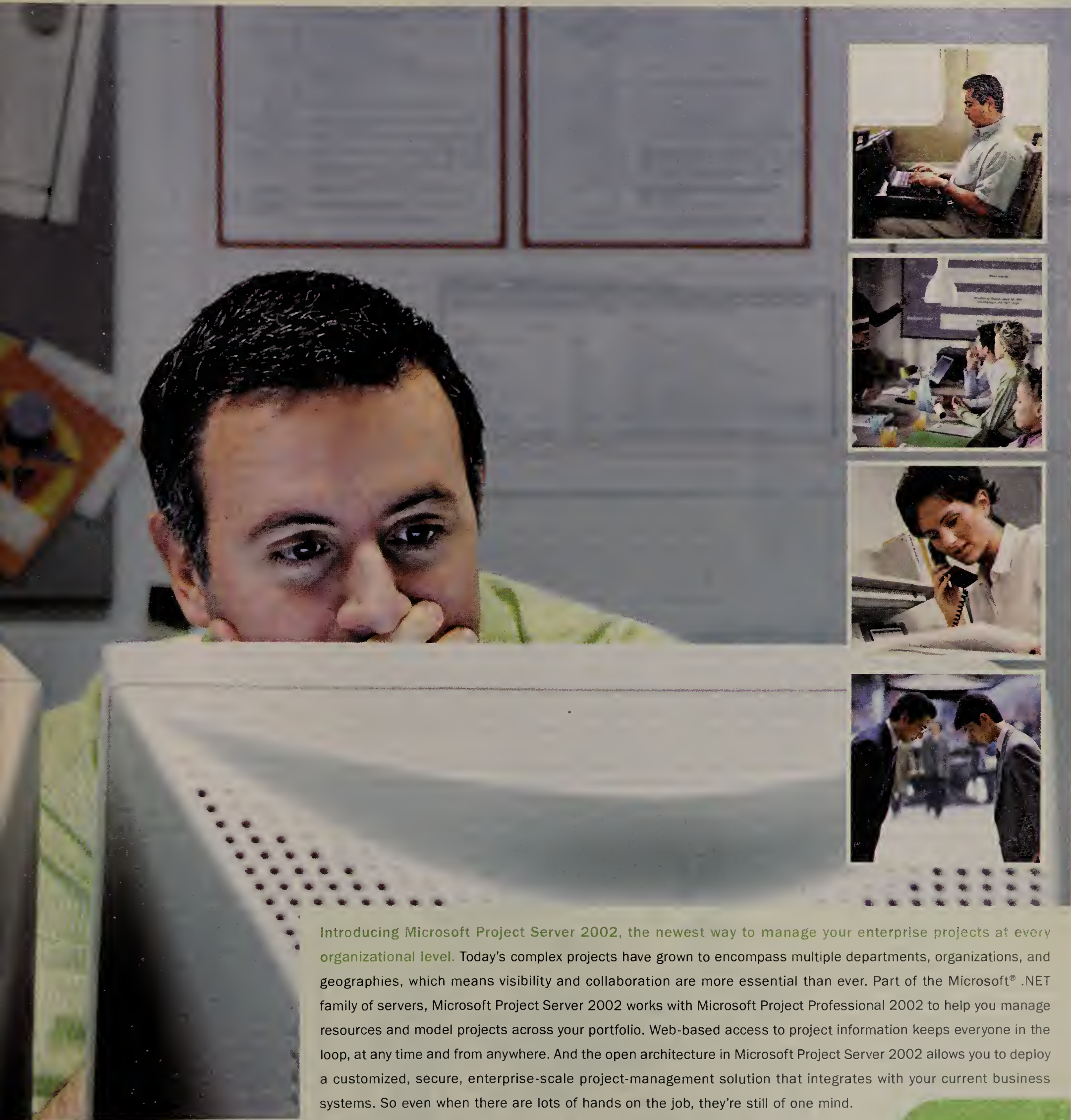
Gouillou said what made him happiest was how little attention was paid to IT. "My goal for the World Cup was that IT should go unnoticed," he said. "People should be paying attention to football, not our network performance." ▀

Reporter Brian Sullivan contributed to this story.

Now the left hand knows what the right hands are doing.



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PATRICIA KEEFE

Independence Day

IT WASN'T THE BEST OF Independence Days. Crappy weather, crummy ethics, a creaking economy and fears of cowardly terrorists combined to cast a pall over our nation's annual celebration of freedom and democratic values.

IT users have been suffering additional miseries.

Skimpy budgets. Reduced staffs. Increased demands. Dictatorial vendors pushing unwanted upgrades, incompatible products in the data center, high prices and indifferent service and support.

Time to despair? No way.

There's more than just a silver lining in these clouds. If savvy IT managers play their cards right, they can declare vendor independence and influence the next generation of enterprise offerings and players.

Many of your strategic vendors have been just as battered by the recession as you, if not more so. Bellwether companies such as IBM, Sun Microsystems, Hewlett-Packard, Oracle and Microsoft have traditionally been the primary drivers in IT markets, lifting emerging technologies and setting standards. All these companies are expected to deliver a product strategy built on a clear understanding of enterprise issues.

But today, they are organizations in the throes of uncertain transitions [QuickLink: 30995]. As a group, they have had their hands full, generally dodging unfamiliar quarterly bullets, sparring with legal opponents and in some cases cutting staff, all while trying to shore up aging product lines and shake up lackluster revenue models — sometimes in the face of user indifference and resistance. And when you think of hot technologies and open-source systems, it's often smaller, more agile companies setting the pace.



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Meanwhile, these enterprise players have lost seasoned executives, they've experienced soberingly low stock prices, and they seem to be running in place. Sun can't seem to make money from Java. Oracle faces user ire on two fronts: IT departments are unhappy with its pricing, and California is investigating a state government contract with the company. Microsoft can't shake antitrust litigation, and its slate of new products and its technology road map aren't selling. Over at IBM and HP, it's too early to gauge what a new CEO on the one hand and a newly merged company on the other are capable of doing. Both companies are engaged in big layoffs and hope to parlay service

and integration strengths into big profits. We'll see.

All these vendors must either find a new stake in the old market or discover and exploit a new one. The latter is where most are setting their sights, and to be successful, they need your attention. Now more than ever, they want to be your strategic partners.

But the days of being a one-vendor shop are gone. Open-source software is the final nail in that coffin, and combined with today's need for application integration and the advent of Web services, it's just the ticket IT needs to regain its freedom and account control.

Ironically, just as it's getting harder to point to any one vendor as the market leader, many users appear to be focusing on standards as a way to cut costs. It's a useful tactic, up to a point. Open-source systems allow users to mix vendors and product lines. You can build your own solutions instead of having to force-fit someone else's. You can open a real dialogue with once-autocratic suppliers.

Freedom of choice, freedom of partners, freedom from technological lockdown. That's an independence worth celebrating. ▀

PIMM FOX

Hardware/Software Split Helps E-Mail

EVER SINCE Research In Motion's (RIM) BlackBerry e-mail pagers hit the enterprise, they've been badges — and handy tools — for executives who want continuous access to e-mail. They've also been ongoing IT headaches.

RIM, the pioneer in the marketplace, has married its hardware and software, much like Apple's Macintosh. Well, as luck would have it, RIM is encountering a competitor that has separated the hardware dependencies of the software.

Upstart Good Technology is trying to best RIM at the wireless game with software that runs on RIM hardware and soon will work with Pocket PCs, Palm handhelds and a yet-to-be-released Good device. If Good can deliver, enterprise IT managers will have a choice regarding the wireless spread of e-mail.

Hardware independence is nice, but IT managers have wanted some refinements to RIM's approach. Good's offering includes an e-mail synchronization service that pumps your desktop e-mail directly to your pager, instead of RIM's redirect service. Plus, there's no cradle, no desktop client and a novel way to set up the server behind the firewall to provide continuous e-mail transmission using the Mobitex network.

With Good, when you configure one of its synchronization servers, it will connect with your Exchange 2000 servers. With RIM, you've got to establish one-to-one relationships between the Exchange servers and the synchronization servers.

Sunnyvale, Calif.-based Good claims that sometime this summer it will offer a lightweight, Web-like query service that will connect to corporate applica-



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computerworld.com/columns

tions. Good seems to have IT in mind.

By cutting ties between software and hardware, Good has focused the debate over what these little gadgets can do. Rather than just transmitting e-mail, they'll become tools to get selective information from the corporate database. And from IT's vantage point, possibly a bit easier to deploy.

Gregory Agahigian, director of global enterprise systems at Boston-based Thomson Financial, has moved about 100 of 400 RIM BlackBerry users over to Good's technology as a test. He says benefits include no software on the desktop (meaning a lower cost of deployment), no cradle, attachment reading and fewer troubleshooting calls.

Rates of \$40 per month per user for airtime, client-side licenses of \$50 per month and server licenses of \$2,000 to \$3,000 are less than what RIM charges, according to both companies' information. But for Agahigian, price isn't much of a factor.

"The dollar savings isn't the big deal," says Agahigian. "We're just looking for something technically simpler and better."

That's a lesson on why hardware and software don't necessarily belong under the same roof. ▀

DAVID MOSCHELLA Scandals Don't Bode Well for IT

HERE IN LONDON, the dominant reaction to the Enron, WorldCom, Adelphia and now Xerox scandals and the subsequent decline in the dollar has been one of almost unrestrained gloating. I guess this is understandable enough. For nearly a decade, the relatively deregulated U.S. economy has been held up as a global model of transparency and governance, with shareholder value promoted as just about the only business measuring stick that mattered. Clearly, this message grated heavily on many European ears, especially the leftward-leaning ones.

My reaction, of course, is quite the opposite: alternately disheartened, infuriated and even sickened by the steady revelations of executive dishonesty and greed.

While one can always argue that

these are just a few isolated examples that don't reflect the true American economy, these once highflying companies are simply too well known to be easily dismissed. More important from our industry's perspective, their actions have further darkened the already bleak prospects for the IT business.

It's bad enough that all four of these companies just happen to be technology-intensive (although fortunately, most people still see Enron as an energy company and not as a business-to-business exchange). In combination with the dot-com collapse, their alleged transgressions would have been a harsh enough blow for any industry to absorb. But even bigger damage stems from the fact that few other industries are as dependent upon the overall state of market confidence as IT.

The reality is that most people, espe-



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cially top executives, don't really understand computers, and therefore, the IT business has always been characterized by high degrees of fear, uncertainty and doubt (FUD). Everybody knows this. But the connection that isn't often made is that it's this very same FUD that explains this industry's tendency to have strong boom and bust cycles, as well as dominant market leaders. Since most

of us are anxious about our IT decisions, it's only natural that we often seek safety in numbers. This results in unusually powerful herd effects and occasional stampedes.

This is why a general loss of confidence is particularly dangerous when it comes to IT markets. It's also why it's hard to see a quick end to the current industrywide slump.

Remember earlier in the year when forecaster after forecaster said that IT

spending would be soft in the first half and then likely pick up in the fall? This was mostly just wishful thinking and was always unlikely. But what's happened is just one more reason for IT users to pull back on spending, and it's clear that a sustained IT industry recovery is now further off than ever.

From a longer-term perspective, the lesson is clear. Because FUD remains such a powerful industrywide force, the IT community must be especially vigilant in protecting its overall image. Clearly, adherence to the highest of ethical standards should be an important part of this effort. The IT business will always be full of risks and unknowns, as well as many great successes and failures. These dramatic swings make things scary enough for most of us. The last thing we need is to have to also worry about the very honesty of the business itself. Unfortunately, this is now the case. The herd won't move in a more positive direction until the industry's image stabilizes and eventually recovers. ▀

READERS' LETTERS

Cobol Won't Bite

STEVE RESNICK'S comment in the article "Warning: Go Slowly With Web Services" [QuickLink: 30603] about legacy data, that information in legacy back-end systems "is still hard to get at with Web services," seems pretty one-sided and possibly without knowledge about CICS itself. With CICS 1.3, it's actually quite easy to write a CICS/Cobol transaction along with HTML pages, to access in the same fashion as "normal" CICS transactions. Resnick's comment is typical of what I'm finding with the application staff in our shop. Just because it's Cobol, they're not impressed, and they don't even want to try it. **Keith Risinger**
Senior systems programmer
New Mexico State University
Las Cruces

Have Ambition, Will Travel

COMPUTERWORLD provides a great service delivering the current state of the U.S. IT field, but

as a reader, I have no idea what the demand is for software engineers in places like New Zealand, Australia, South Africa, the U.K., etc. However, your Global Best Places to Work list is impressive [QuickLink: a1960]. Readers who strive for prosperity in this field will go anywhere and need a good resource that won't overlook options abroad. With the sad state of the domestic IT job market, in which people need several months to find placement, many would consider leaving the country for a quicker opportunity, if not for adventure.

Justin Gombos
Albuquerque, N.M.

Agile Methods Need Care

I FOUND Patricia Keefe's June 10 editorial on "Trustworthy IT" [QuickLink: 30381] quite interesting. As she mentioned, besides cost-cutting, trust issues are going to be a problem for IT managers. I recently spoke with an IT director at a large company who was trying to wrestle

with this problem: How does one build trust and create new working relationships with business units? It was interesting to see the mention of agile methods and extreme project management, since I had given the director similar advice, with a few caveats: Just dropping agile methods into the organization can itself create problems, and one also has to address communications, commitment, skills, process and management systems issues to be successful.

Sanjay Murthi
President
SMGlobal Inc.
Cary, N.C.

IT Labor Debate

REGARDING the June 3 article "Workers Blast ITAA Study Claims" [QuickLink: 30228] and the forecast for an IT skill set shortage, I have but one thing to say: Shame on you. Shame on you for giving the predominantly off-shore-backed ITAA a voice. Shame on ITAA spokesman Bob Cohen for uttering the

nonsensical statement, "you can't overlook what the requirements are or what the hiring companies' views are." If the ITAA identified 532 managers who are "struggling" to find workers with "technical expertise, domain knowledge and project experience," please feel free to give all of them my contact information. Finding such workers isn't difficult in this market. Unless, of course, your interests lie elsewhere. Thanks for the update, Bob. It's good to know where the ITAA stands.

G. Ballantyne
Atlanta

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

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TECHNOLOGY

THIS WEEK

TECH TAKES ON RISK

IT, in the form of statistical modeling and optimization, can help a company understand and manage the risks it faces. **PAGE 24**

GM ON THE MOVE

IT infrastructure initiatives ranging from wireless LANs to content caching are on the front burner at General Motors, says Tony Scott, the automaker's chief technology officer. **PAGE 26**

FUTURE WATCH

Atomic-resolution storage may one day replace magnetic tapes and disks. But tape and disk storage will get a lot cheaper first. **PAGE 30**

QUICKSTUDY

Chip fabrication is the process by which multibillion-dollar plants turn common sand into microprocessors, memory chips and integrated

circuits of all kinds. Find out more in this week's tutorial. **PAGE 32**

EMERGING TECHNOLOGIES

Server blade makers have cut a path into IT by designing systems that take less power and space than earlier products. Proprietary designs have slowed acceptance, but evolving standards may change that. **PAGE 33**

SECURITY JOURNAL

Security infrastructure becomes a revenue center as the marketing department hijacks Vince Tuesday's new, secure remote access system. **PAGE 34**

NICHOLAS PETRELEY

Palladium Power Play

I HOPE YOU CAUGHT the *Computerworld* article about Microsoft's proposal for a new security chip called Palladium [QuickLink: 31000]. I read the story a half-dozen times, and I'm still not sure if it's a real project or an attempt at self-deprecating humor by Microsoft. There's so much wrong with this idea that it's difficult to decide where to start debunking it.

In case you haven't been following this story, Palladium is a security and encryption chip that Microsoft wants every PC and motherboard manufacturer to adopt for all new PCs. Microsoft would use this chip in Windows for a variety of things, the most likely being a way to make digital rights

management foolproof. Digital rights management is an initiative designed to make sure you have no say over how you store and transfer music, video and other copyrighted content to and from your computer.

According to Mario Juarez, group product manager for the content security business unit at Microsoft, Palladium also creates a secure space within the computer that's untouchable by other programs running on the same computer. He promotes this as a way to prevent specially targeted programs from becoming infected by a virus.

One wonders if Juarez knows this is double talk or if he simply has no clue about how one designs an operating system to protect programs from becoming infected by a virus. Unix and Windows XP both already have the guts necessary to prevent a virus from spreading. Windows and its applications are still vulnerable because they have design flaws and security holes. You can't plug holes like these with a security chip.

Indeed, who else thinks that if Microsoft bloats Windows even more to accommodate Palladium, the company is more likely to open more security holes than it closes? Isn't this the same Microsoft famous for its security hole of the week?

But here's the *crème de la crème*. When asked if you would need Windows to take advantage of Palladium, Juarez said, "The short answer is yeah."

Then Juarez explained, "We understand the importance of being inclusive. We don't want this to be seen as a Microsoft-only initiative. Our goal is to be as inclusive as possible." After that, he said there would be some level of interoperability with other platforms.

Let's see if we can sort this out. You

must run Windows to use Palladium. Microsoft's goal is to include as many platforms as possible. Other platforms will have some (but not total) interoperability. In short, it will be a Windows-only, multiplatform, partially interoperable system. Nope, sorry, there's no way to sort this out.

But I'll give you a hint as to which way it will go. As I pointed out above, the only reasonable purpose for Palladium will be digital rights management. Microsoft owns the patent on the concept of a digital rights management operating system. If Palladium ever becomes a standard part of the PC architecture, all Microsoft has to do is persuade content providers to require the use of Palladium to listen to music or watch video content. (Can anyone think of something easier to do?) Once that's in place, Microsoft might just as well own every PC on the planet.

Hollywood and the rest of the entertainment industry might love Palladium, but consumers will hate it.

Unfortunately, PC makers are looking for any excuse to revive the PC market. If they can convince customers that Palladium will solve their security and virus problems, they might back this plan just to sell more PCs. My advice is to force them to yank it out by refusing to buy any Palladium-enabled PCs.

In the end, a Hollywood-backed Palladium plan is roughly the opposite of the Hollywood Palladium itself. Founded in 1940, this dancing and dining establishment featured big talent during World War II but kept prices low enough to let just about anyone in. Microsoft has the "let just about anyone in" security down pat, but the only useful thing about Palladium is that it lets Hollywood force people to pay more for big talent. ▀



NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at nicholas@petreley.com.



JAMES YANG

FIFTY MILLION DOLLARS PER year. That's what The Peoples Gas Light and Coke Co. saved by creating a weather model.

The Chicago-based utility wrote a computer model that went well beyond industry norms. Using a mathematical optimization technique called linear programming, the model didn't simply look at the most likely weather scenario in predicting demand for natural gas, as was standard in the mid-1990s; it considered 10 weather scenarios and optimized for all of them simultaneously.

The model gave Peoples Gas so much new insight into its business that the utility was able to negotiate better contracts with gas suppliers, pipeline owners and gas storage vendors. "The savings also came from competing suppliers who started offering us what we wanted, instead of, 'Take it or leave it,'" says John Wirick, coordinator of gas supply planning.

Wirick calls the model a negotiating tool, but it's also an example of a broad class of applications called risk management systems. Enabled by powerful computers, deep data warehouses and

modern analytical tools, risk management systems are growing in power and use, especially among companies that buy and sell commodities and financial instruments. Users are turning to these applications for help managing their market, credit, capital and operations risks.

Energy companies in particular are seeing a heightened need to understand and control risks. Market turbulence spawned by the California energy crisis, the collapse of Enron Corp. and emerging news of energy trading irregularities are all increasing companies' exposure to price, credit and regulatory risks.

Risk management doesn't always mean risk reduction. Sometimes, companies elect to take on more risk, looking for greater returns. Risk management is all about understanding the various risks a company faces and adjusting its operations or policies to achieve what it considers an optimum risk profile. But, users warn, these systems involve their own risks.

Cary Oswald, director of risk operations and systems at Xcel Energy Inc. in Minneapolis, says he worries about two kinds of risks. The first has to do with buying and

ADVICE FROM THE PROS

■ Remember, if you're right 95% of the time, you're wrong one day a month.

■ Don't rely on just one risk model for big decisions.

■ Don't count on historical data to predict the future.

■ Include unlikely but catastrophic events in your models.

■ Sometimes a simple spreadsheet will do.

■ Integrate your risk management silos.

Riding Herd on

Risk

IT helps tame uncertainty in prices, credit, interest rates, weather and more. **By Gary H. Anthes**

Risk Glossary

Value at risk (VAR): A statistical technique for assessing the market risk of portfolios of assets or liabilities. A 95% confidence level means the portfolio is expected to incur less than a maximum daily loss 95 days out of 100.

Monte Carlo simulation: A mathematical technique used for estimating the VAR of a portfolio, and for other things. It's computer-intensive, but it can solve many problems that can't be solved any other way. It randomly generates thousands of scenarios that in total conform to a specified probability distribution, such as a normal, or bell-shaped, curve. Scenarios lying in the extreme tails of the distribution represent unlikely but extraordinary gains and losses.

Risk-adjusted return: The average rate of return of an asset or portfolio adjusted for the volatility of that return. Risk-adjusted returns can be ranked and analyzed by comparing ratios calculated by dividing return by volatility.

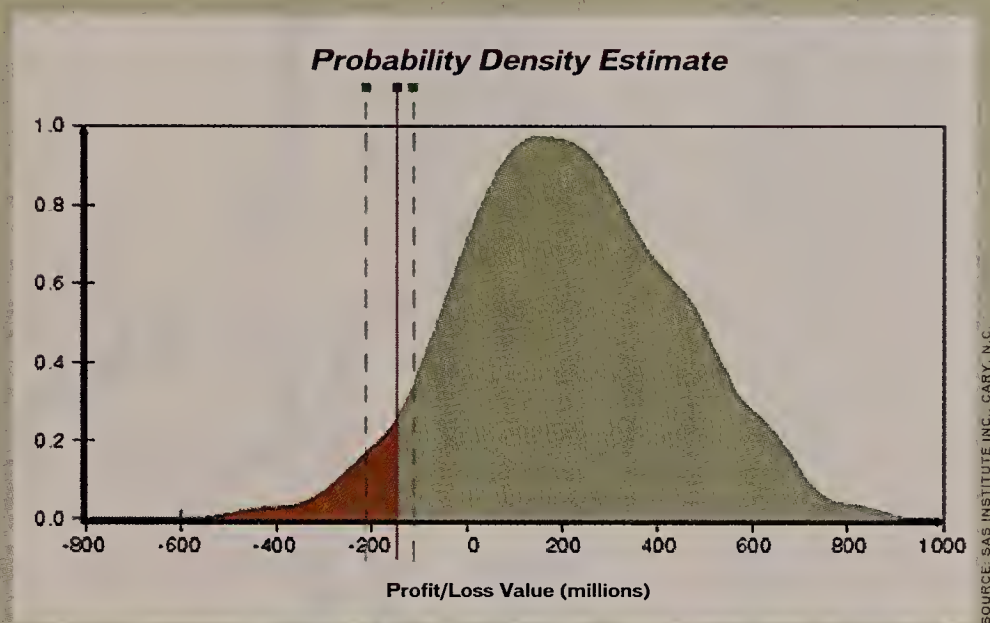
selling gas, electric power and coal — 100 to 200 times a day at prices set by volatile markets. "The second is regulatory risk," he says. "We can only charge so much, so if gas prices are too high, we can't recover our full cost."

Xcel deals with both risks by using the ProSim energy market analysis application from Henwood Energy Services Inc. in Sacramento, Calif., to model operations at its power generating facilities. ProSim takes weather forecasts from various sources and computes how much natural gas is needed at each plant and how much electricity will be generated every hour for the next 24 months.

Those results then go into Panorama, a portfolio analysis and risk management system from SunGard Data Systems Inc. in Wayne, Pa. It uses statistical techniques to compute the gas, coal and electricity price risks Xcel faces under various scenarios. Panorama computes value at risk (VAR), a statistical measure of the riskiness of a portfolio — usually as of the end of the day — based on historic and current prices and price volatility (see charts).

Xcel's daily Panorama reports show VAR at the 95% confidence level; that is, a given portfolio's exposure to loss in one day doesn't exceed a certain stated amount with a probability of 95%, Oswald says.

But being right 95% of the time means you're wrong 5% of the time, or about one day per month. "Prices can go to infinity," Oswald says. "VAR is a statistically valid approach, but you can't ever say that's the most you'll lose."



▲ Shown is an example of a classic graphical report of a VAR measure computed using a stochastic model-based Monte Carlo simulation. This graph would be read as "Tomorrow, our maximum expected loss at a 95% confidence interval is \$182 million." Such measures are used to document compliance with corporate or regulatory governance or to guide trading tactics and strategy execution.

The daily risk reports are read religiously by senior managers at Xcel, Oswald says. Actions the company might take based on the reports include adjusting inventory levels or changing buy and sell commitments in order to decrease risk or improve return.

Acting on just one risk model or technique can be a big mistake, risk managers say. Another is assuming that the future can be predicted just by looking at historical data. "That's where a lot of

people fail," says Judy Pokorny, assistant vice president for risk management at Peoples Energy Corp. in Chicago.

According to Pokorny, companies tend not to consider the risk from a catastrophic event just because it hasn't occurred before. "For example, your largest creditor defaults; what does that do to your business? Or you have a major price change that never occurred in history before," she says. It's not necessary to use fancy modeling to look at such scenarios — a simple spreadsheet will do, she says.

Pokorny also cautions that although risk management systems work well with risks that can be quantified, such as price and credit risks, they aren't so good with other kinds of risks. "For example, are you capturing all your trades? That's always a question," she says. "Also, your legal risks — are your contracts legal and enforceable? Then there's the regulatory risks of having the regulators change the rules at a moment's notice."

Peoples Energy, the parent company of Peoples Gas, has a formal risk management program that considers risks in four broad areas — commodity prices, interest rates, customer demand (which is influenced by factors such as the weather) and credit risks. The company uses statistical models and formulas including Monte Carlo simulation, VAR analysis and risk-adjusted return on capital.

Peoples Gas invented a weather model to help it minimize risks on the expense side of the income statement, including the cost of buying, moving

and storing natural gas. But the parent company uses a different model to look at the risks to its revenue stream arising from variations in customers' energy needs. Using regression analysis, the company looked at the connection between customer demand and weather as measured in heating-degree days.

"Based on that analysis, we purchased a very long-term weather insurance product," Pokorny says. "We looked at historical weather data and said if we paid this insurance premium for the past 40 years, what would have been our payout." Last year, the insurance policy paid out \$8 million, and this year it will pay about \$10 million, she says, adding, "In the first year, it paid all our premiums for the next five."

In a 2000 survey of 130 midsize and large companies, The Institute of Internal Auditors Inc.'s Research Foundation in Altamonte Springs, Fla., and Towers Perrin in New York found that just 49% of the companies had a complete or partial enterprise risk management (ERM) framework in place. The survey defined that as "a rigorous and coordinated approach to assessing and responding to all risks that affect... strategic and financial objectives." The most often cited reason (55%) for not having an ERM program was a company culture that resisted it.

Charles Le Grand, director of technical practices at The Institute for Internal Auditors, said risk management in many companies exists in organizational silos. Systems that support risk management are often similarly isolated from one another. Another mistake companies often make is failing to look at historical data to analyze the causes of past problems, he says.

Xcel Energy has yet to achieve the kind of systems integration that Le Grand calls for. "We have a lot of systems that don't talk to the risk management system, so there's a lot of manual double data entry," Oswald says. But Xcel is rolling out middleware from Palo Alto, Calif.-based Tibco Software Inc. that will allow one application, such as a gas billing system, to "publish" information while another "subscribes" to it.

"In a perfect world, my guys wouldn't have to put anything into the system," Oswald says. But the manual data entry is necessary, he adds. "We could not be in the nonregulated trading business without a risk management platform."

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TOOLS FOR ENTERPRISE RISK MANAGEMENT

Percentage of companies using the following tools:

Risk mapping of individual risks (such as using frequency and severity maps)	75%
Risk-assessing workshops	70%
Pro forma financial modeling	44%
Scenario planning	41%
Economic scenario generations	31%
Monte Carlo simulations	30%
Probabilistic (stochastic) simulations	30%
Management "dashboards"	28%
Catastrophe modeling	20%
Behavior modification incentives	16%
Optimization software	14%

SOURCE: 2000 SURVEY OF 130 MIDSIZE AND LARGE COMPANIES BY THE INSTITUTE OF INTERNAL AUDITORS RESEARCH FOUNDATION AND TOWERS PERRIN

TECHNOLOGY

Q&A

Economic times may be uncertain, but that hasn't held back **Tony Scott**. As chief technology officer

at General Motors Corp. and head of the company's Information Systems & Services group, he is pursuing IT infrastructure initiatives ranging from wireless LANs to content caching. Scott spoke with Computerworld's Robert L. Mitchell about GM's current and planned IT initiatives.

What infrastructure technologies top your IT agenda right now? We continue to see pressure in the network, from a bandwidth and utilization perspective. So we're investing in [content]-caching [servers] this year fairly heavily. We're also investing in security fairly heavily [by] reimplementing our network architecture into security zones.

What benefits did content-caching edge servers bring? There were lots of areas in our network that have pressure on them where the cost to upgrade would be fairly significant. [Through] strategic placement in the network, as well as educating the development community to design applications that can take advantage of the caching, we're seeing pretty nice benefits.

What are the biggest challenges you face in rolling out those initiatives? The biggest problem is complexity. When you think about all the layers of technology it takes to put out a simple Web application today, the opportunities for misconfiguration or creating a bottleneck unintentionally are just enormous. And ... even if you get it right initially, there's always the need for constant changes in the environment, whether it's upgrading software or scaling issues or any number of different things.

GM has been upgrading its desktop and server infrastructure to Windows 2000 for some time. What makes that process so time-consuming? When you've got to migrate tens of thousands of users from one desktop to another and preserve all the applications and settings and the user look and feel, that's an enormous task — and still one that hasn't been solved, really. There are lots of different tools, and each helps in its own way, but that's still the single biggest issue.

One of the fundamental things we've done that pays off more than anything else is simplification. Before you even start doing the migration, eliminate as much as possible. In every area we

GM Caches Out

TONY SCOTT



Title: Chief technology officer

Company: General Motors Corp.

Business: Designs, builds and markets cars and trucks. Manufacturing operations are established in more than 30 countries, and vehicles are sold in about 200 countries.

2001 sales: More than 8.5 million cars and trucks worldwide

 www.gm.com

found old, obsolete applications that we could simply turn off or make go away as part of the migration, thereby simplifying the rollout.

In January, you were considering using Office XP and .Net Web services to link to server-based data on sales and information on the status of orders. What have you done so far? Not a lot yet. We're getting more interested in the security model around Web services, and we're sorting a bunch of things out there. I guess that's the one thing. There's a fair amount of grayness in [Web services security], and that's holding up any broad deployment at this point.

What are your criteria for prioritizing projects in today's uncertain economic climate? Security takes the highest priority — security- and safety-related things. In our manufacturing environ-

ments, anything that comes up in those areas always floats to the top. The next thing is business demand. We use the business community to help prioritize projects beyond that — and they are not shy about telling us what they want, and when and where they want it.

We have a corporate mandate for common and global [projects]. Given a dollar to spend, and one is a regional, local project and the other is a global, common sort of project, the global, common one will tend to float to the top.

What emerging technologies do you find most compelling? The obvious one is wireless [Ethernet], which we're beginning to take strong advantage of, particularly in the factory environment. And I'm excited about the new tablet PCs. When you combine the tablet PC

with wireless, you create a whole new way of thinking about computing. We're doing an early look at that.

I'm particularly excited about this Handspring Trio that was just announced, the color one. I think all of that's quite intriguing.

Which would fit better at GM: a Palm OS-based device or a Windows CE device?

From an infrastructure standpoint, what we have focused on is the middleware piece. We know the end device — the PDA — is going to go through a very rapid evolutionary cycle, so we've tried to concentrate on the middleware that lets us talk to whatever device happens to be there. That's helped us already. Even in the [past] year or so, we've gone through two or three generations of handheld devices, and we have not had to change the application one iota.

What's your biggest gripe about the IT your teams work with? One is the pain of upgrades. I don't see anybody that's really cracked the code on that. Every opportunity we have [had] to do a software upgrade or a hardware upgrade [has had] a fairly high level of pain.

Quality and complexity probably go hand in hand in terms of No. 2. The number of patches and emergency upgrades and so on still continues to be relatively high. And most of that you can pin on inadequate testing or just the sheer complexity of the product. That complexity factor is huge.

If you could replace one legacy IT infrastructure right now with state-of-the-art technology to make your job easier — no strings attached — what would you choose? In the factory environment,

we still have a bunch of very old technologies. These are DOS-based applications, for example, probably running on 286-class machines at best. They still work, so there's no business case for replacing them, and yet the support cost is high. If you could consolidate and centralize a lot of these applications, you could take a fair amount of cost out.

More medium term, we have a lot of first-generation client/server systems ... where there's a thick client on the desktop, and I would replace those with a more Web-based configuration. Those cost a lot in terms of ongoing support and maintenance. Every time we've got to go upgrade the desktop, we have to retest hundreds and hundreds of these applications, and that causes a fair amount of support costs. ▀

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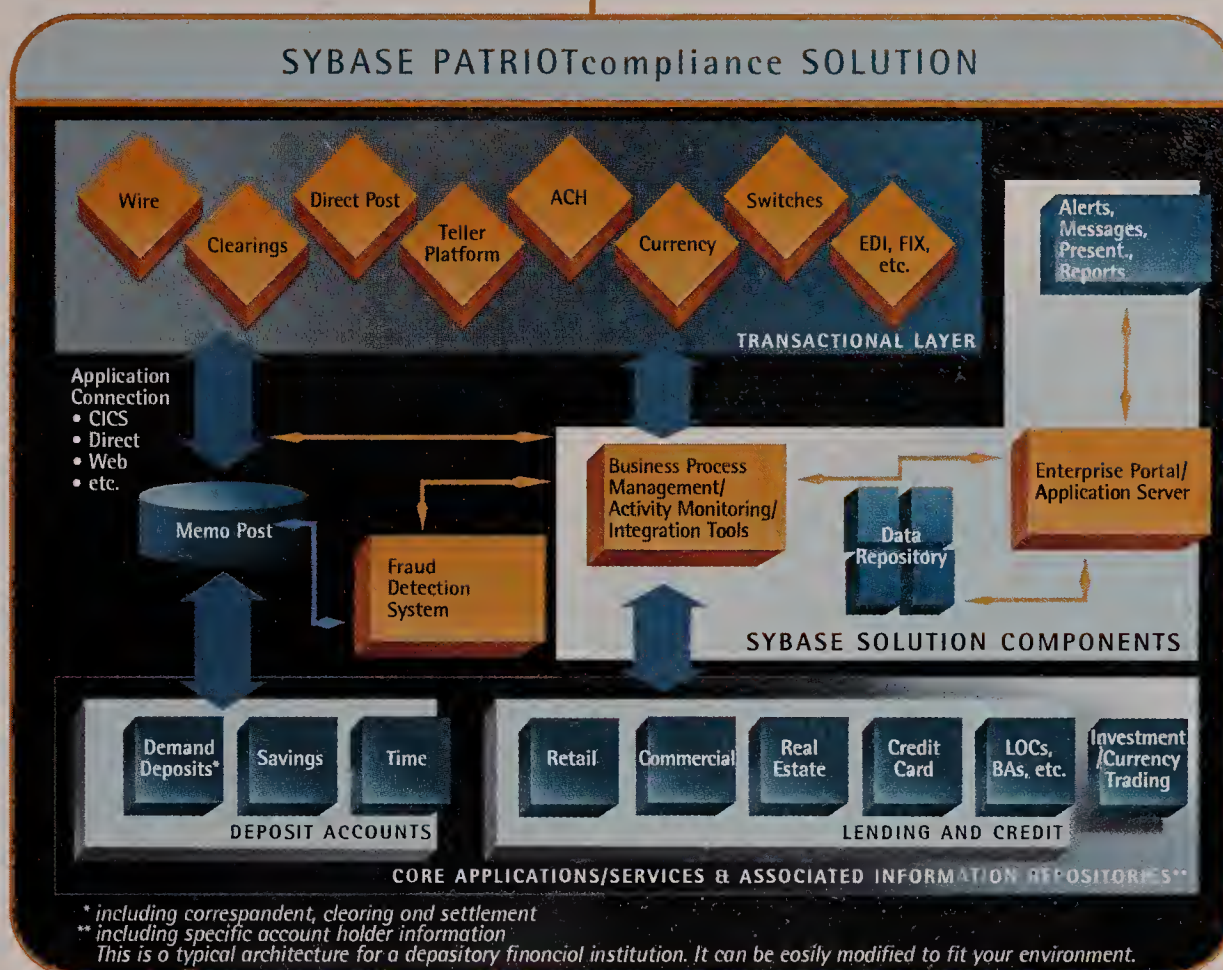
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The USA PATRIOT Act contains strong measures to prevent, detect and prosecute terrorism and international money laundering, greatly expanding the breadth and depth of the old laws. Broadly stated, the act requires that financial institutions know their customers and, to the greatest extent possible, their customers' customers. Compliance for bankers and securities dealers is required by October 2002. Non-compliance could involve costly civil and criminal penalties.

The Incredible Shrinking Storage Media

25 million pages on a postage stamp.

By Gary H. Anthes

LAST MONTH, IBM made the stunning announcement that it had written data to a storage medium at a density of 1T bit per square inch, enough to pack 25 million printed pages on a postage-stamp-size chip.

Pundits predicting the progress of IT invariably invoke Moore's Law, by which the density of transistors on a chip — and hence the performance of memory and processors — has doubled every 18 months for the past three decades.

But that same kind of progress is occurring in other quarters of IT as well. During the 1990s, the storage density of magnetic disks increased 75% per year, outpacing even Moore's Law. As for tape, in May, IBM announced that it has developed a linear digital tape cartridge that can hold 1TB

of data, 10 times the going rate. IBM says it hopes to drive the cost of tape storage from \$5 per gigabyte (including storage hardware and software) today to 5 cents in five years.

Indeed, advances in magnetic media, and in the drives that write on and read them, promise to keep pushing users happily down those cost curves. And a few new technologies may take storage costs to levels of affordability that fundamentally alter the way companies

think about data storage.

Making magnetic media hold more data has traditionally been a matter of making the grains in the recording medium, and the spots that hold the recorded bit, ever smaller and closer together. At the same time, tape and disk heads have become more precise, applying a sharper and better-positioned

recording pulse. These improvements have been augmented by better error-correction and control software.

But at about 100G bits per square inch, the magnetic grains begin to interfere with one another, leading to thermal instability and short-lived recordings. So researchers are turning to the following radical new approaches:

IBM's Millipede. The 1T-bit-per-square-inch recording device is reminiscent of the old card-punch. The device uses nanoscale points to punch indentations in a plastic film, one per bit. Unlike a punched card, the film can be rerecorded.

The device could address individual atoms and eventually record between 1 and 10 petabits per square inch, "the ultimate limit," says Currie Munce, director of storage systems technology at Yorktown Heights, N.Y.-based IBM Research. In about four years, Milli-

pede storage will find initial application in mobile devices, where small size and low power requirements are important, he says.

But tiny, power-efficient Millipede devices could go into data centers. For years, the economic yardstick for storage has been dollars per megabyte, Munce says. But companies' appetite for storage is growing so fast that IT managers are starting to evaluate storage media in terms of megabyte per square foot or per watt. "They're saying, 'How much floor space does it take, and how much air conditioning will I require?'" Munce says.

Carnegie Mellon University's HAMR. The Pittsburgh university's Data Storage Systems Center is developing heat-assisted magnetic recording (HAMR) technology that in five years will lead to disk drives with storage densities of 1T bit per square inch. And the goal is to do that with greater reliability than is possible today, says Robert M. White, director of the center.

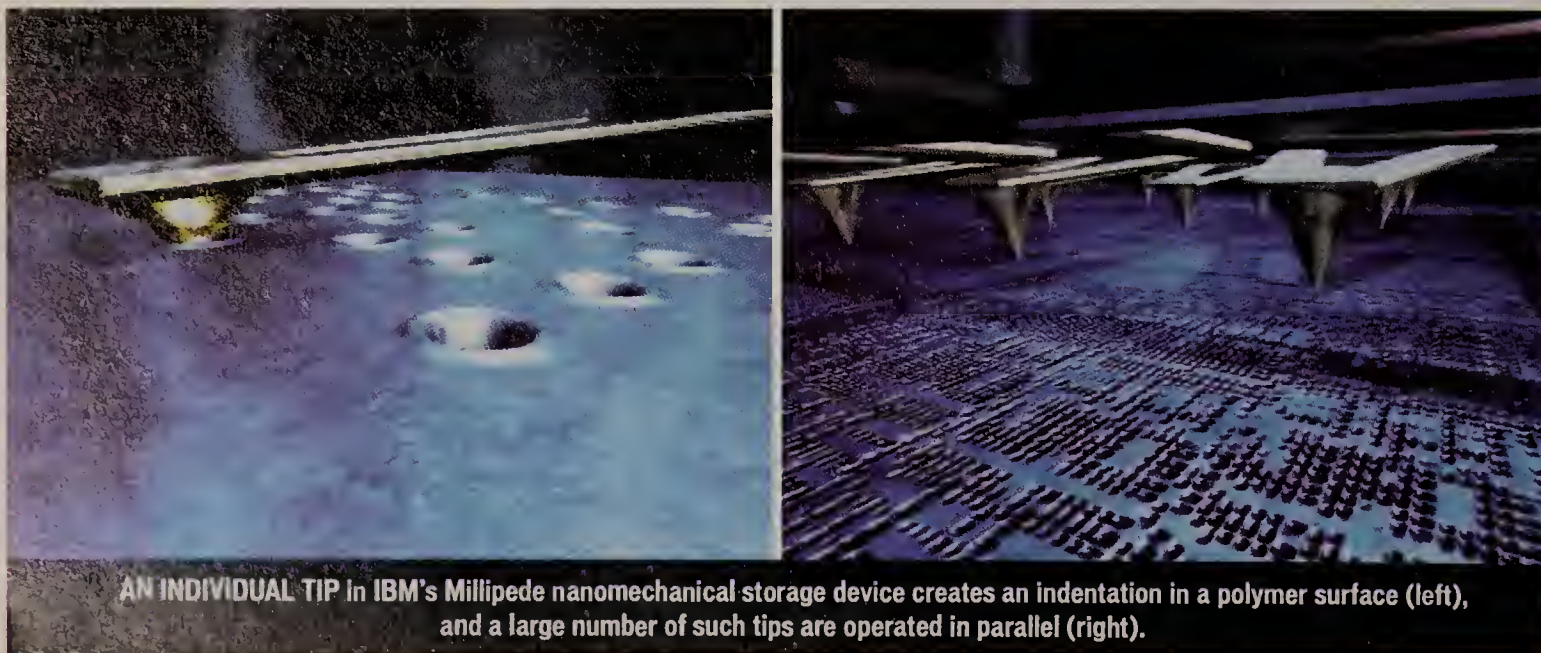
An HAMR disk drive will look like a conventional drive but will include a laser generator on the read/write head. It solves the thermal stability problem by heating the disk surface with a laser beam at the precise spot where a data bit is to be recorded. That makes it easier to write on the medium, and the subsequent cooling stabilizes the data.

HAMR could take the cost of disk storage, now at about \$1 per gigabyte, to 10 cents in five years, White says.

Hewlett-Packard Co.'s Atomic Resolution Storage (ARS). HP is using atomic-scale probes to send beams of electrons to the recording medium, which moves under thousands of these read/write probes. The beams change the medium to either a crystalline or an amorphous state, the state indicating whether a bit has the value 0 or 1. HP says there will be commercial applications within five years.

According to Chuck Morehouse, director of HP's Information Storage Laboratory in Palo Alto, Calif., data access times for ARS devices will be from 10 to 100 times shorter than for conventional hard drives. And the bandwidth for data transfer can be just about anything an application requires, because multiple probes can be deployed in parallel on one chip. "With one ARS device, you'll have the equivalent of read/write heads from many hundreds of disks," Morehouse says. ▀

FUTURE WATCH



AN INDIVIDUAL TIP in IBM's Millipede nanomechanical storage device creates an indentation in a polymer surface (left), and a large number of such tips are operated in parallel (right).

INFORMATION OVERLOAD

The need for improvements in storage media performance is clear: One study says the world produces 250MB of data for every person on earth annually.

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Making Microchips

BY GARY H. ANTHERS

THERE ARE FEW things in the world as simple as sand, and perhaps none as complex as computer chips. Yet the simple element silicon in sand is the starting point for making the integrated circuits that power everything today, from supercomputers to cell phones to microwave ovens.

Turning sand into tiny devices with millions of components is an extraordinary feat of science and engineering that would have seemed impossible when the transistor was invented at Bell Labs in 1947.

Silicon is a natural semiconductor. Under some conditions, it conducts electricity; under others, it acts as an insulator. Silicon's electrical properties can be altered by the addition of impurities, a process called doping. These characteristics make it an ideal material for making transistors, which are simple devices that amplify electrical signals. Transistors can also act as switches — on/off devices used in combination to represent the Boolean operators “and,” “or” and “not.”

Several types of microchips are made today. Microprocessors are logic chips that perform the computations inside most commercial computers. Memory chips store informa-

tion. Digital signal processors convert between analog and digital signals [QuickLink: a2270]. Application-specific integrated circuits are special-purpose chips used in things such as cars and appliances.

The Process

Chips are made in multi-billion-dollar fabrication plants called fabs. Fabs melt and refine sand to produce 99.9999% pure single-crystal silicon ingots. Saws slice the ingots into wafers about as thick as a dime and several inches in diameter. The wafers are cleaned and polished, and each one is used to build multiple chips. These and subsequent steps are done in a “clean room” environment, where extensive precautions are taken to prevent contamination by dust and other foreign substances.

DEFINITION

Chip fabrication is the process by which multibillion-dollar plants turn common sand into microprocessors, memory chips and integrated circuits of all kinds. Producing a microchip is one of the most complicated, exacting and expensive of all industrial activities, yet makers continue to double the capabilities of chips every 18 to 24 months.

A nonconducting layer of silicon dioxide is grown or deposited on the surface of the silicon wafer, and that layer is covered with a photosensitive chemical called a photoresist.

The photoresist is exposed to ultraviolet light shined through a patterned plate, or “mask,” which hardens the areas exposed to the light. Unexposed areas are then etched away by hot gasses to reveal the silicon dioxide base below. The base and the silicon layer below are further etched to varying depths.

The photoresist hardened by this process of photolithography is then stripped away, leaving a 3-D landscape on the chip that replicates the circuit design embodied in the mask. The electrical conductivity of certain parts of the chip can also be altered by doping them with chemicals under heat and

pressure. Photolithography using different masks, followed by more etching and doping, can be repeated hundreds of times for the same chip, producing a more complex integrated circuit at each step.

To create conducting paths between the components etched into the chip, the entire chip is overlaid with a thin layer of metal — usually aluminum — and the lithography and etching process is used again to remove all but the thin conducting pathways. Sometimes several layers of conductors, separated by glass insulators, are laid down.

Each chip on the wafer is tested for correct performance and then separated from other chips on the wafer by a saw. Good chips are placed into the supporting packages that allow them to be plugged into circuit boards, and bad chips are marked and discarded. ▀

Designing and Testing ICs

When Jack Kilby at Texas Instruments Inc. in Dallas designed the first integrated circuit (IC) in 1958, it had fewer than 10 components. His design was hand-drawn.

Such circuits can now have more than 100 million parts, and much of the design work and testing is done by computer. Specifications for most basic logic functions reside in code repositories, and designing a complex integrated circuit begins with choosing the appropriate building blocks from a library. New functions are designed from scratch, transistor by transistor.

The designs are then turned into digital circuit diagrams by computers. The circuits are drawn onto glass plates called photomasks by computer-controlled laser beams and then etched into the glass by chemicals. The ensuing manufacturing process is incredibly exacting. A few misplaced atoms can ruin a chip.

Modern chips are so complex that it's impossible to test them exhaustively. Chip makers rely on incomplete testing combined with statistical analysis to bring them a high degree of confidence — but never certainty — that their designs are sound.

— Gary H. Anters

QUICK STUDY

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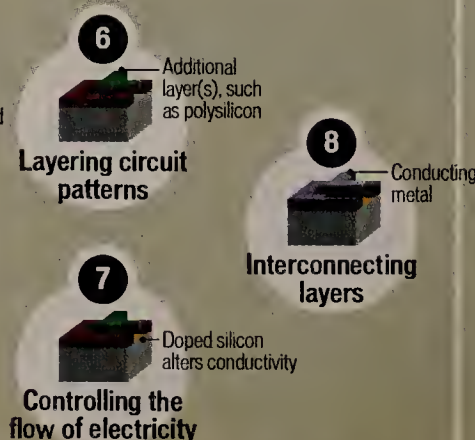
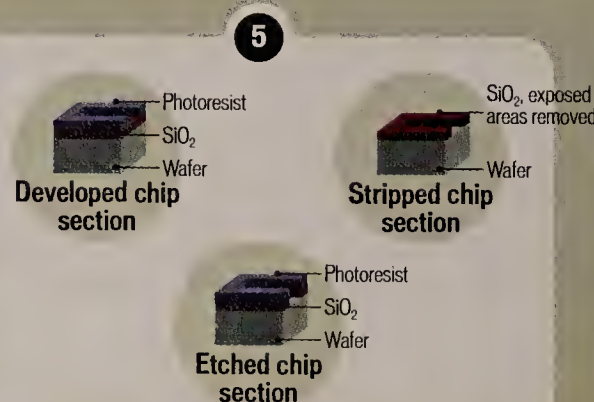
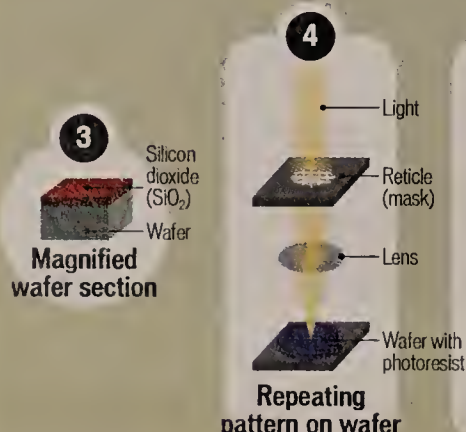
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Server Blades Sharpen Net's Edge

OUTLOOK: Blade servers are a hot product development area, but they still lack standards. The best application today may be for edge servers. **By Mark Hall**

FEW DISPUTE the notion that blade servers will slice their way into most data centers during the next few years. But choosing when to make a home for the rack-mounted systems depends on how well this fledgling technology fits into your operations.

Blade servers are compact server cards that plug into a chassis and typically share a common backplane and power source. They offer impressive performance, capacity, ease of management and other features you'd expect to see in hulking pedestal servers. And they're unencumbered by the size, discrete cabling and power-hungry characteristics of those ubiquitous beige boxes.

Standards are still evolving for blade servers, however, and that leaves data center managers with a wide range of incompatible choices.

One differentiator among blade server makers is their choice of processors. Some vendors use Santa Clara, Calif.-based Transmeta Corp.'s low-power TM5600; others use Intel Corp.'s Ultra Low Voltage Pentium III processor.

These chips, which execute the x86 instruction set common to Windows, Linux and other operating systems, range in speed from 633 MHz to 800 MHz. They ship with 512MB of P2-level on-chip cache memory. Their low power requirements allow designs with processor board voltage as low as 1.1 to 0.95 volts.

Server blades are packed with a fairly standard array of features that vendors implement in different ways. They typically have a CPU with up to 2GB of RAM, onboard video and mass storage, one or more Fast Ethernet ports, and a serial port for out-of-band systems management.

Blade sizes range from 1U to 6U, but they are distinct from 1U "pizza box" servers because server blades share network cabling and power. (The "U" rating is based on the height of the blade: A 1U blade is 1.75-in. tall.)

Although Ethernet is the current I/O bus transport mechanism, vendors vary in the configurations they choose and how they design physical interconnects and the software interface on the rack's backplane, which accepts the blades. A single Hewlett-Packard Co. E-class rack's backplane tops out at 20 server blades, whereas RLX Technologies Inc. in The Woodlands, Texas, needs 24 blades to stuff its rack. And the racks aren't interoperable.

Still, a fully configured rack makes blade servers attractive

BLADE EXPERIMENT

Los Alamos National Laboratory tests a 240-node blade server cluster.

QuickLink: 30775
www.computerworld.com

market for blade servers will grow from \$100 million this year to \$3.7 billion in 2006 – approximately 5% of the total market.

While less important than they once were, power and space requirements are still a concern in data centers, Melenovsky says. In addition, blade servers, which are hot-swappable, are relatively easy to deploy, use and replace. Once an administrator has loaded an application onto a single blade, it's a breeze to copy those images onto other blades to create a Web server farm, users say.

– Mark Hall

■ AT A GLANCE

WHAT IS IT?

Ultracompact server cards with onboard CPU, memory, video and network connections that plug into a common, high-speed backplane.

WHAT'S THE BENEFIT?

Faster server provisioning and reconfiguration, lower power requirements and a smaller footprint.

BEST APPLICATIONS

Web servers and caching servers for edge computing.

CAVEATS

Proprietary I/O bus designs can limit interoperability, but standards such as cPCI and, eventually, InfiniBand are emerging.

to data center managers, says Yatish Mishra, president and chief technology officer at RagingWire Telecommunications Inc. He says the systems take up less room and consume 25% less power than conventional servers, which is critical to controlling costs for the Sacramento, Calif.-based service provider.

"We see immediate applications for blade servers on the edge of the network," Mishra says, citing Web, Secure Sockets Layer and caching server clusters as likely uses.

But not everyone is convinced that blade servers cut the mustard. Jim Collins, chief operating officer at Affinity Internet Inc. in El Segundo, Calif., argues that in theory, blade servers are great, but their proprietary nature makes them a more expensive investment than a cluster of 1U computers because they need to fit into existing network and cluster management applications.

Affinity has conducted two rounds of blade server testing but has put purchases on hold, Collins says. "While blades absolutely make sense for our business, we're waiting for the economics to justify them," he says. ▀

■ PRODUCT PIPELINE

Blade Designs: A Work in Progress

Emerging technologies often lack comprehensive standards upon which vendors can agree, and blade servers are no different. HP is leading the standards charge by designing its blade server products around its new **OpenBlade** specification, which is based on **CompactPCI (cPCI)**, an expansion bus design that's popular in the telecommunications market.

New Bus Standards

PCI Industrial Computer Manufacturers Group Inc., a 700-company consortium in Wakefield, Mass., defines the standard for cPCI, which was originally designed for harsher environmental conditions than are normally found in data centers. cPCI, in turn, may eventually face competition from **InfiniBand**, which could boost backplane speeds to as high as 6GB/sec. [QuickLink: 28410].

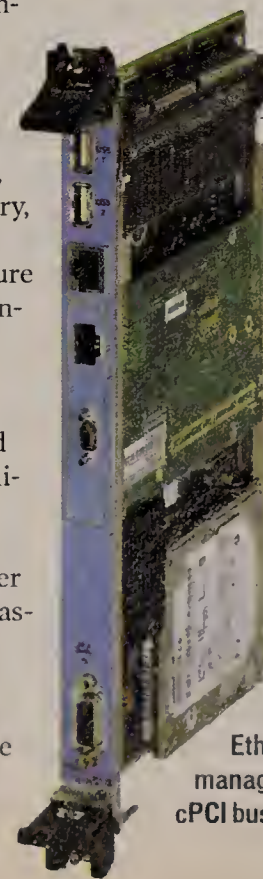
The New Blades

HP's current blade design is based on **Intel's** low-power, 700-MHz Pentium III (see photo). In March, Intel announced a low-power 800-MHz Pentium III designed to allow two processors on a single blade. **Fujitsu Siemens Computers GmbH** and **Dell Computer Corp.**

are expected to introduce products based on that chip later this year. And **Sun Microsystems Inc.** plans to launch blade server designs based on both Intel's chips and Sun's UltraSPARC.

– Mark Hall

← **HP's bc1100** server blade packs a 700-MHz Pentium III with 512MB of error checking and correcting RAM, a 30GB hard disk, video, Ethernet and a serial management port on a 6U cPCI bus card.



■ USER ASSESSMENT

Data Centers Voice Concerns

The data center is the ultimate proving ground for blade servers, but getting inside hasn't been easy.

The primary reason behind data center managers' hesitance lies in the proprietary designs. "We have a network operations center, so whatever we buy must be able to work with it," says Jim Collins, chief operating officer at Affinity Internet. So far, that hasn't been the case.

Even blade server users like Yatish Mishra, president and chief

technology officer at RagingWire Telecommunications, acknowledge that nonstandard blade server hardware may be a problem for some. "You cannot plug blades from HP into a Dell backplane," he says.

Also, two of the driving forces behind the inception of blade servers – out-of-control electricity costs and overcrowded data centers – have diminished, says Mark Melenovsky, an analyst at IDC in Framingham, Mass. But still, he predicts that the

Marketing Hijacks Remote Access Initiative

They came, they saw, they commandeered the new VPN system for their new marketing program. But who's complaining? By Vince Tuesday

I'VE WRITTEN IN THE PAST about my struggle to offer safe, cheap remote access to our users. One approach that worked well was using a virtual private network (VPN).

We could have used the VPN tools included in our firewall, but I'm from the old school of information security that says it's safer to keep components as distinct and simple as possible. So we used a VPN 3000 Series Concentrator from Cisco Systems Inc.

The only problem with the concentrator is that it lacks a few of the features of the Cisco IOS operating system that I've come to expect, such as the Cisco Terminal Access Controller Access Control System security protocol that authenticates administrator access. The VPN box comes from one of Cisco's acquisitions, so I'm hoping the company will add these features in the next release.

On the upside, the concentrator supports our SecurID system for user authentication, and the client software is well supported and works fine. Cisco claims that the system is compatible with the IPsec protocol and that we should be able to use any IPsec implementation. For now, we'll ease support worries and stick with end-to-end Cisco parts.

This was ticking over nicely until we added a few test users. The tests went well, but our users included a product development manager for some of the financial systems we offer to our customers. At the

time, these systems were very secure, running on private dedicated circuits with very tight access control and monitoring. However, deploying our equipment to their sites and ordering a leased line to one of our points of presence was very slow and expensive.

The product development group would love to offer free trials of our services to potential customers. Once the product manager saw the VPN service, she realized we could do this quickly and at a low cost.

Suddenly, all the equipment we configured for home-support access was taken away to develop this new service.

I'm glad to say we've been included

from the beginning. The need for swift time to market and low cost hasn't increased the risks we'll accept. We're using SecureID to authenticate customers, although it takes a few days to generate the tokens and send them out. We've built a three-tier architecture to bring the untrusted outside connections to nearly

the same level of assurance as our dedicated lines.

The first firewall filters connections to just IPsec to the outside of the VPN 3000. The inside interface to the box is protected with a firewall that allows access to only our application and the midtier services that application requires. The midtier server is then restricted to seeing only the internal devices it needs to offer the financial service.

So what risks remain? A bug may occur in the Cisco box that allows it to be hacked. However, it would probably take an attacker a long time to compromise the server using some application-coding error and even more time on our internal servers. But the attacker's time is limited only if we notice any attempts and respond before they get through.

So, one of our requirements is that both host and network intrusion-detection systems (IDS) be included in the architecture. But where should they go? We rely on them to watch and listen for attacks, so it's vital that we can repeatedly test them to confirm that they are working correctly.

To ensure that we can monitor fully, we've placed a network IDS on either side of the concentrator and inside the midtier server. We chose not to put one outside the first firewall because we already know about the very high level of attacks out there and can use firewall logs to spot trends. We don't expect to see anything but IPsec at the first IDS, and we don't expect to be able to see into the traffic, but it's easy to set the rules to alert us if anything else goes past.

The heart of our early warning system is the detector monitoring between the VPN and the midtier server. The traffic, which is rich in application detail, is unencrypted so we

can monitor it. The only problem: How can we test to confirm that the IDS is working correctly?

We could get a separate Internet connection, connect with the VPN, authenticate to the concentrator, log into the application and then try to send an attack. Even this complicated series of events doesn't allow us to test much, though, because the VPN tunnel drops many of the attacks that we use to test our IDS.

Relying on Informer

We had been struggling with this for a while when I bumped into an old colleague at a networking event. He pointed me to Gainesville, Fla.-based Blade-Software's IDS Informer. This IDS testing tool allows us to import predefined sets of attacks and configure them to appear to come over the VPN. Then, simply by connecting to the right hub, we can send them directly past the IDS.

This was what we needed: a simple, repeatable test that we can carry out with a laptop or from our server. Blade-Software releases updates for each attack, so we can also make sure our IDS vendor is up to date by testing whether these are detected. We'll never be able to offer the performance of a leased line over a VPN, but for a low-cost and quick-to-deploy taste of our services, this is perfect. And I can sleep easy knowing that our security monitoring infrastructure is working as planned. ▀

This week's journal is written by a real security manager, "Vince Tuesday," whose name and employer have been disguised for obvious reasons. Contact him at vince.tuesday@hushmail.com, or join the discussion in our forum.

QuickLink: a1590

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SECURITY LOG

USER REVIEW

Informer Turns In Results

Blade-Software's IDS Informer is simple to use: With four clicks, your IDS console will go bright red with alarms, highlighting the failure of IDS consoles to display information in a useful manner.

But the difficulty of getting useful attack details from the IDS means that matching attacks sent with those detected by the IDS is cumbersome. (Blade-Software says it's working on tools to automate that process for the top IDS products.) Nonetheless, Informer is a worthwhile tool. We found a problem in our network IDS, which prompted the vendor to release a fix.

— Vince Tuesday

Cyberthreats

Respondents who think a major cyberattack is likely in the U.S. in the next 12 months:

IT PROFESSIONALS

49%

IT SECURITY PROFESSIONALS

59%

Respondents who think there's a gap between the threat and the government's ability to defend against it:

IT PROFESSIONALS

72%

IT SECURITY PROFESSIONALS

84%

SOURCE: BUSINESS SOFTWARE ALLIANCE CYBERSECURITY SURVEY OF 395 IT PROFESSIONALS, JUNE 2002.

Zone Labs Debuts Firewall

Zone Labs Inc. in San Francisco has launched ZoneAlarm Plus (\$40), which falls in between the company's other online security offerings: the free ZoneAlarm and its \$50 feature-laden big brother, ZoneAlarm Pro.

Features include advanced e-mail virus detection, hacker tracking and program validation at the component level. But users who want advanced features such as cookie control and ad blocking will still need the high-end package.

**SECURITY
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“

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MANAGEMENT

THIS WEEK

WATCHING WORKERS

Greater worker productivity is the goal at companies deploying increasingly sophisticated employee-monitoring tools. But misusing the data these tools generate can cripple morale and drive workers to try to beat the system. **PAGE 38**



CHANGING LANES

Mitsubishi Motor Sales of America is relying heavily on IT to shift its customer focus into high gear. "We led with our philosophy, and technology was the lever," says Mitsubishi's Greg O'Neill (above). **PAGE 40**

BUILD IT, AND MAYBE THEY WILL COME

The U.S. construction industry has traditionally been a technology laggard. That's beginning to change as some companies embrace wireless and the Web to bolster project management and cut costs. Now the challenge is bringing other industry players on board. **PAGE 42**

PHYSICIAN, LOG ON AND HEAL THYSELF

Boston doctors have warmed up to a knowledge management system that challenges their judgments in prescribing medications to patients. **PAGE 44**

BART PERKINS

Step 1: The Baseline

WANT TO KNOW where to begin if you're launching a program to get better leverage from your IT suppliers and in your buying processes? Start by establishing a baseline of your company's IT supplier portfolio.

The baseline includes information on your suppliers, buying processes and cost structure, enabling you to fully understand the

size and scope of your supplier portfolio. The baseline may uncover surprises — you may have more suppliers than you estimated or you may have several contracts with one supplier. You may also find many suppliers that don't have contracts — companies often find that more than 60% of their suppliers either never signed contracts or are operating under expired contracts. You may discover buying that's being done without considering whether the product fits within your IT architecture. For example, one of my clients found that three business units were buying Sun servers even though the architecture specified HP. The baseline will provide the data that you need to develop an effective action plan.

But it may not be as simple as it seems. One of my clients was recently asked to assemble a list of its top 10 suppliers. After repeated attempts, it developed four separate lists, one from each business unit. Yet, all four neglected to include either IBM or AT&T, which were Nos. 1 and 3 on the final list.

The effort required to set a baseline will vary depending on the complexity of your IT organization, but any baseline should include data on the following:

Supplier portfolio. How many suppliers you have, the products and services each provides, their importance to your operations, and the contract terms (such as maintenance fees and renewal periods).

Buying processes. How consistent are buying processes across the company, and who buys what.

Cost structure. How much the company spends per supplier, architectural component and business unit.

The baseline will help you uncover opportunities for volume discounts. You may also find redundant technologies (such as NT and NetWare) or processes (such as three ways of providing desktop support). This can lead you to streamlining your supplier portfolio by merging, consolidating or eliminating technologies and processes. The baseline will also assess how well

you're aligning your architecture with your infrastructure (or your blueprint with what you build). Ask yourself the following questions:

■ How accurately does your infrastructure reflect your architecture?

■ How well does your architecture support your business strategy?

■ Is your architecture explicit enough to guide your IT buyers in their decisions?

The baseline will identify opportunities for savings, buying process improvements and infrastructure rationalization. Each opportunity must be analyzed to understand its costs, benefits and priority.

A baseline provides valuable data at any time but is particularly effective with:

Highly decentralized organizations. In these types of operations, you're probably not getting maximum economies of scale from your suppliers.

A new CIO or CFO. "Quick hit" cost savings provide instant credibility with top management.

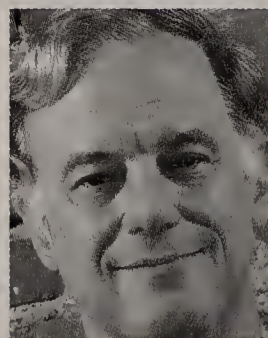
A CIO or CFO facing significant cost-cutting pressure. It's better to cut costs through a supplier management program than through layoffs.

Mergers and acquisitions. A baseline can provide you with your best opportunity to rationalize two architectures and the supporting infrastructures.

Divestitures. Most contracts will have to be rewritten; a baseline will provide the data required to renegotiate them.

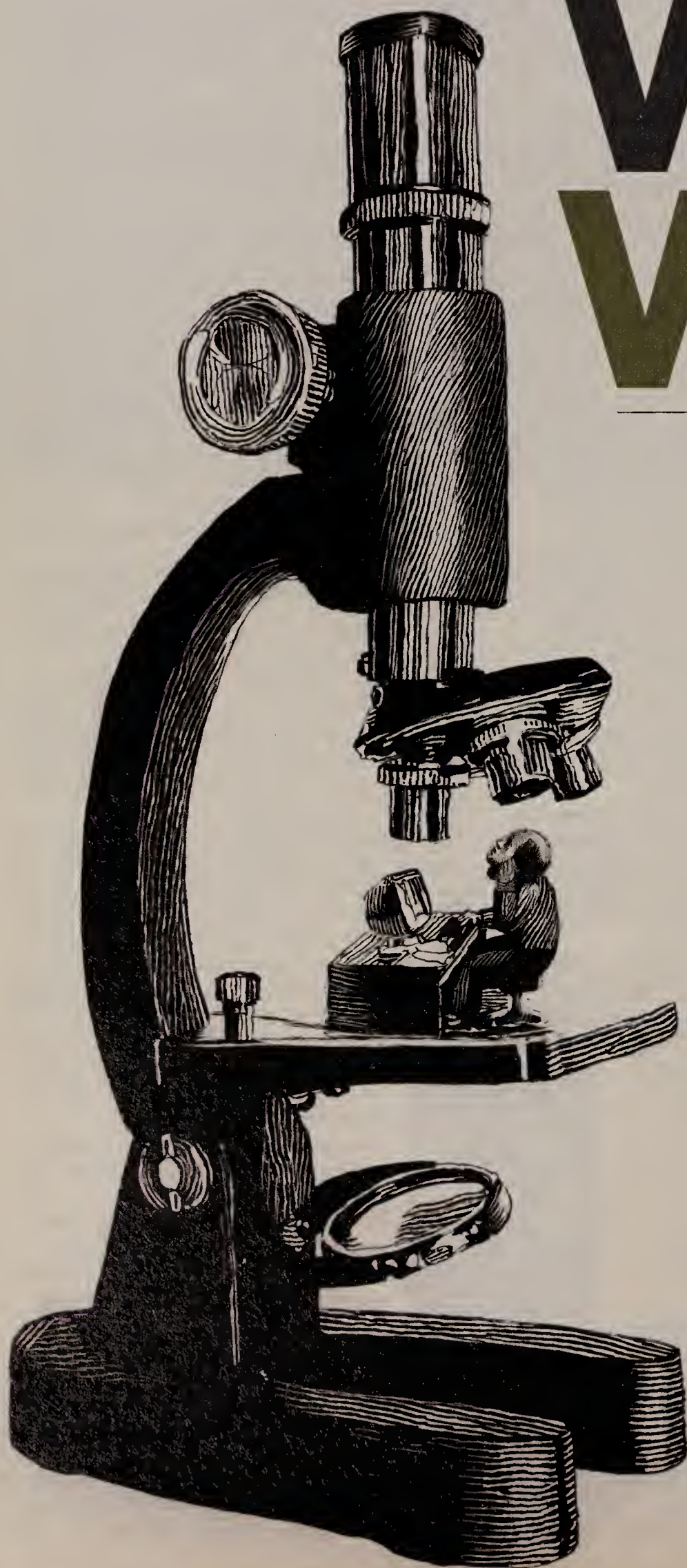
A transforming event. A new CEO or an unexpected competitive threat can cause widespread changes. A baseline will reveal strengths and weaknesses that can help you make your infrastructure more responsive to new requirements.

Your supplier portfolio contains many opportunities to reduce costs and align your infrastructure with your architecture. And a baseline provides a complete picture of your portfolio's strengths and weaknesses, enabling you to choose the opportunities with the greatest return. ■



BART PERKINS, a former CIO at Tricon Global Restaurants Inc. and Dole Food Co., is managing partner at Leverage Partners Inc. in Louisville, Ky., which helps CIOs manage their IT suppliers. Contact him at BartPerkins@LeveragePartners.com.

WATCH WORK



The do's and don'ts of monitoring employee productivity

IN HIS OFF-BROADWAY SHOW, *21 Dog Years: Doing Time @ Amazon.com*, Mike Daisey recalls his bizarre days as a call center representative at the Seattle-based online retailer.

When his manager pulled him aside to tell him that he wasn't taking enough calls, he struggled to find a solution. Eventually, it came to him. He'd hang up on customers in mid-sentence so he could quickly move on to the next caller. Sure enough, his call volume soared, he became the hero of the department, and he was quickly promoted to business development, where he spent his days honing his video-game skills.

Daisey's story was meant to evoke chuckles, but at a recent performance it also prompted several knowing looks, a likely sign that it's not too far from reality. With increasingly sophisticated monitoring tools, employers are keeping close watch on their IT and other workers to ensure efficient operations and high productivity levels. But things can also go hopelessly awry if, as Daisey illustrates, monitoring tools wind up crippling morale or driving workers to try to beat the system. Despite such pitfalls, many companies find that monitoring tools can produce valuable returns as long as they are used in conjunction with other worker performance criteria, not in isolation.

According to two surveys conducted in the first

BY MELISSA SOLOMON

ING ERS

half of 2001 by The ePolicy Institute, the American Management Association and *U.S. News & World Report*, 82% of 1,627 large employers said they monitor their workers' activities in some fashion, ranging from tracking employees' Internet usage and monitoring e-mail messages and phone calls to reviewing computer files. More than 15% of respondents said they even videotape employees.

And as horror stories of workplace Internet slackers circulate through the media [QuickLink: 31118] and software becomes more sophisticated, monitoring employee productivity isn't just reserved for help desk technicians or call center employees, as it was in the past. Now it's used on employees at all levels in all departments of companies.

Xerox Corp. in Stamford, Conn., has been using Microsoft Office and Excel spreadsheets for four years to monitor IT projects and assess how long it takes IT staffers to complete tasks, explains Carla Lorek, manager of communications and quality at Xerox's information management division. Such data helps managers pinpoint areas of improvement so that time estimates for projects come closer to the actual amount of time spent, she explains.

As the practice of project portfolio management grows in popularity, project managers as well as top-level executives are starting to review details about individual IT employee activities.

But the information management group at Xerox doesn't use its system to monitor individual IT employee performance. Instead, Lorek says, the company uses employee monitoring as a project management tool to better estimate resources.

"As soon as people start to figure out they're being monitored and tracked, pretty much, you get what you ask for," says Lorek, explaining that if people feel they're the victims of bean counters who ignore quality and focus solely on numbers, they'll figure out how to drive numbers up without putting effort into quality.

"Metrics are a great thing to have. It's just, you have to think about how they're being used," Lorek says. "People are skeptical by nature. They'll say 'Yup, I will code,' but something else may give."

"Nobody gets shot for not meeting a deadline," Lorek adds. "The pressure's too high already in IT."

Wise words, according to veteran users of moni-

toring software. Help desk and call center managers, who have been using tracking tools since the days of keystroke-monitoring attachments on electric typewriters, agree that while such tools can be helpful in improving processes, they can just as easily hamper an IT department's effectiveness by driving down morale if they're used in isolation.

"Hopefully, managers take them for what they are, which is just another tool," says Ronald E. Kibbe, senior systems manager for the IT help desk at The Ohio State University Medical Center in Columbus. "On paper, someone might look really dynamite. . . . But how satisfied was the customer?"

In addition to customer service feedback forms on the help desk's Web site, Kibbe uses Remedy monitoring software from San Diego-based Peregrine Systems Inc. and Symposium call management and tracking software from Brampton, Ontario-based Nortel Networks Ltd. to spot trends or areas where systems are lacking or not being adhered to. Kibbe then combines that data with customer feedback and comprehensive employee-performance observations.

Kibbe says he still encounters some resistance from IT help desk staffers, who resent being watched by management or having to worry about their numbers. One worker, for instance, has a great call-resolution rate and provides detailed, informative call reports. But his call time is higher than average, so he's concerned that will hurt his performance reviews. But Kibbe repeatedly assures workers that everyone has strengths and weaknesses and that the ultimate goal is to balance those on the team.

Personal Growth

Brad Barborak, a senior IT help desk technician at The Longaberger Co., said he finds that monitoring metrics help him do his job better. His company, a Newark, Ohio-based maker of hand-woven baskets with nearly 8,000 employees, has been using Peregrine software to pull statistics from its help desk for about a year.

"It's generated some really interesting numbers for us," he says. "Just now, we're starting to get some really good trend analysis." For instance, Barborak and his team can use the data to determine whether common help desk calls indicate a need for more user training or if certain applications are too complex for their intended audiences.

The monitoring data also lets Barborak track the status of calls he has to forward to other layers of

support so he can be sure problems get resolved. "I'm a bit of a perfectionist," he says. "I hate to see a call leave my desk."

That improves his call resolution rate, and since salaries are tied to performance, it improves his chances for getting a raise, he explains.

The Thomson Corp.'s Prometric subsidiary ties its incentive program for IT help desk staff to the departmental metrics it pulls from monitoring software, according to B.T. Bentley, director of the Baltimore-based educational testing center's global help desk. When the company introduced its automated call distribution switch and reporting application from Lucent Technologies Inc. in Murray Hill, N.J., and data collection and reporting tools from Magic Solutions in Santa Clara, Calif., there was some resistance from employees, says Bentley. But when bonuses and recognition were tied to the system, employees warmed up to it because it gave them clear targets, he says.

"We've seen a dramatic improvement in the quality of the documentation," he says.

But Carolyn Healey, publisher of Santa Barbara, Calif.-based Supportindustry.com, an online community for service and support professionals, cautions against tying compensation to data culled from monitoring tools for fear it will create the wrong goals. If customer service representatives are told they'll get bonuses if they answer a certain number of calls, they may rush customers along. Instead, she says, rewards should be tied to customer satisfaction, which can be measured by follow-up customer surveys.

There are other pitfalls. For example, if a major incident, such as remote users being locked out of a dial-in virtual private network, caused the help desk to be flooded with calls, there would be no time to document conversations, says Brian Phillips, a second-level help desk technician at STI Knowledge Inc., a help desk outsourcer in Atlanta. Once the rush was over, employees would be stuck with a stack of calls to log, which could add an extra hour or two to their shifts.

But, excluding such extreme circumstances, Phillips finds the data culled from STI's ticket-tracking software and IBM's Tivoli and Advantis systems extremely useful. It takes time to get accustomed to documenting calls, he explains, but once it becomes familiar, it's actually quicker and cleaner than taking personal notes on a call. "It just takes a little while to get used to," says Phillips. ▀

Corporate Sleuths

Some of the newer employee-monitoring systems on the market include:

INSTANT-MESSAGE MONITORING SOFTWARE, which reviews and stores instant messages on both public and private instant messaging networks; designed for regulated industries.

Product: IM Auditor, FaceTime Communications Inc., Foster City, Calif.

Pricing: Starts at \$15,000.

VOICE-RECOGNITION SOFTWARE that tracks and analyzes calls for words, phrases, tone, speed or situations – such as when a representative cuts off a customer – that employers want to monitor.

Product: SpeechMinor, Utopy Inc., San Francisco

Pricing: Starts at \$800 per seat per category.

PERFORMANCE-INCENTIVE SOFTWARE that monitors employee activities and ties that information into an online reward-points system where employees can earn gifts for using the behaviors encouraged by the company.

Vendor: CultureWorx, Rosemont, Ill.

Pricing: \$5,000-\$50,000 set up fee; \$10 per person per month.

IT powers Mitsubishi's customer care.

By Kathleen Melymuka

CUSTOMER SERVICE is a direction, not a place. One of the lessons Mitsubishi Motor Sales of America Inc. has learned during a two-year road trip in that direction is that there's always another mile you can go. But if you stick to your planned route, maintain a safe speed and keep your passengers happy, you'll find that it's a trip worth taking.

Until the late 1990s, Mitsubishi was only about cars, and its approach to retail customer service reflected that. There were more than 18 toll-free customer service numbers that callers had to navigate to find information on topics ranging from financing to sales to repairs. "We were fragmented in our approach, and we clearly lacked a customer focus," says Greg O'Neill, executive vice president and general manager.

Mitsubishi decided to change that. In the spring of 1999, as part of a companywide shift to an increased focus on customers, executives challenged the call center to provide "one voice and one set of ears for the customer,"

says CIO Tony Romero. That was the beginning of a continuing drive toward improved customer service that would eventually engage multiple departments and 18 vendors.

Today, Mitsubishi has one call center and an outsourced service provider that handles the most basic calls. The cost per call has decreased by about two-thirds, and that savings alone paid for the system in 18 months, according to Rich Donnelson, director of customer relations. The system saves agents time and uncertainty and enabled the call center to handle 38% more volume in

2001 than in 2000, with an even staffing level. Meanwhile, the company's customer satisfaction rate rose by 8%, according to a survey by Westlake Village, Calif.-based J.D. Power and Associates.

Road Rules

Mitsubishi's call center project team included members from its sales, marketing and finance departments, all of which contributed resources as needed. Early on, the team members established some rules of the road.

First, they would choose best-of-breed vendors, not the hyped customer

relationship management (CRM) suites that seemed intent on force-fitting Mitsubishi's needs into set product offerings. But that required a constant struggle to keep 18 vendors heading in the same direction.

"We had days where we wanted to kill everybody," Romero says with a laugh. But, he explains, he insisted from the start that every major vendor attend weekly project meetings and work as part of the team. "If it went down, everyone was going down together," he says.

Despite the difficulties in managing

CASE STUDY

Mitsubishi Motor Sales of America Inc.

(A SUBSIDIARY OF
MITSUBISHI MOTORS CORP.)

LOCATION: Cypress, Calif.

TOTAL EMPLOYEES: 1,151

TOTAL IT EMPLOYEES: 111

U.S. SALES VOLUME (2001):
322,393 vehicles

U.S. MARKET SHARE (2001): 1.9%

GREG O'NEILL (left), executive vice president and general manager at Mitsubishi, says his company was fragmented and "clearly lacked a customer focus."



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multiple vendors, re-search firm Gartner Inc. recommends taking the best-of-breed approach, because suites tend to be insufficiently robust. In a January report on CRM, Gartner analyst Michael Maoz said that CRM suites will be "a poor or even dangerous" solution through 2003 because of their immaturity.

The team members also decided to implement changes slowly, adding a technology only when all employees were using the last one implemented. This approach allowed call center agents to get comfortable with the new technology over time. "It's fine for us to sit in a boardroom and say, 'Yep, that's the model,' but we have to let them pace to it," O'Neill says.

Darrell Rigby, a director at Bain & Co. in Boston who specializes in CRM, says that's the only way to go. "Don't try to do it all at once," he says. "Start simple, and make sure the system has the ability to grow with your needs."

To accommodate this deliberate, modular approach, all products had to pass the "three S" test: Is it simple? Does it satisfy? Is it scalable? "If we couldn't answer yes to all three, we didn't do it," says Greg Stahl, Mitsubishi's director of advertising.

Changing Lanes

The journey began in earnest in June 1999, when Mitsubishi chose to outsource its most basic level of customer calls to Baltimore-based Sitel Corp. Within two months, Mitsubishi's 18 toll-free customer numbers and the multiple call centers behind them were consolidated, and call center software from Siebel Systems Inc. in San Mateo, Calif., was implemented.

As part of the companywide customer focus, a new customer-centric database was consolidated in-house the next year. The database became the engine powering the call center, but unfortunately, dirty data was a major stumbling block. The project stalled for months as the data was cleansed and updated.

In early 2001, a phone switch from Avaya Inc. in Basking Ridge, N.J., allowed flexible, skills-based call routing, enabling more efficient use of resources. Callers to the single toll-free number were routed based on menu choices. About half the callers got the information they needed from an interactive voice response unit, which

can answer fairly sophisticated queries without live contact. Simple calls went to Sitel, and the rest were routed to call center agents with the appropriate skills.

In March 2001, graphical user interface upgrades put 11 screens' worth of customer information on one screen. Siebel's Smart Scripts workflow software provided agents with decision-tree scripts and

automated customer correspondence.

In May 2001, Mitsubishi managers began listening to outsourced service calls, and they could see agents' screens with Avaya's IP Agent software. The next month, the company started using Director workforce management software from Blue Pumpkin Software Inc. in Sunnyvale, Calif., to forecast coverage hourly. Ra'anana, Israel-based Nice Systems Ltd.'s NiceLog software is used to record agents' voice and screen activity for quality assurance and training.

In the course of these and other implementations, three major challenges arose — one around users, and two around vendors.

One was that the new technologies from the vendors involved streamlined service processes, but they also required agents to change the way they worked, a prospect many found daunting. "The reps were saying, 'What's in it for me?'" recalls Rand Rozar, manager of customer relations at Mitsubishi.

Aside from happier customers, the benefits include career growth and higher pay. Previously, agents in separate call centers handled specific areas: accounts, vehicles, titles or retailer queries. Now the silos are gone and agents can learn new skills in multiple areas, greatly increasing call center flexibility. Blue Pumpkin's Director schedules training time during lags, and agents who learn multiple skills earn more money. Call center turnover, which has traditionally been more than 20%, was about 7% last year.

Driving Priority

With so much technology in play, another major challenge was staying in the driver's seat. "You can be completely wowed by [vendor] promises and taken way off course," says Carlos McEwan, manager of relationship marketing at Mitsubishi. "You have to be practical about using technology in moderation" and not get swept away by vendors' visions, he says.

Another issue was vendor control. Rebecca Caldera, Mitsubishi's project development manager, contends that you have to learn to put your foot down. "Sometimes the vendors didn't seem to realize that we were the customer," she says. "You have to tell the vendor, 'Who is driving this? We're driving it!'"

O'Neill agrees. "We led with our philosophy, and technology was the lever, as opposed to being mesmerized by a solution and reverse-engineering ourselves into it," he says.

Although the technology has helped cut costs and improve service, Donnel-

Under the Hood

SOME OF THE MAJOR VENDORS INVOLVED IN MITSUBISHI'S CUSTOMER INITIATIVE:

Avaya Inc.
Basking Ridge, N.J.
Skills-based call routing, phone switching

Blue Pumpkin Software Inc.
Sunnyvale, Calif.
Workforce management software

E.piphany Inc.
San Mateo, Calif.
Data-mining software

Experian
A subsidiary of Gus PLC in London
Data-cleansing and demographic information

Nice Systems Ltd.
Ra'anana, Israel
Call- and screen-recording technology

Siebel Systems Inc.
San Mateo, Calif.
CRM software

Sitel Corp.
Baltimore
Outsourced call center services

son says the biggest advantages are still down the road. Among the ideas in the works are the following:


- Cross-selling and outbound sales campaigns from the call center.
- Automatic routing of the top customers to the best agents for the best possible service.
- Integration of additional channels such as cell phones, chat and e-mail.
- Incorporating useful Web links onto screens to point callers to additional information in real time.
- Personal Web pages tailored with individual customer information.
- Online financing in real time.

O'Neill says the executive team gets additional mileage from the system. Team members regularly listen in on service calls to get a feel for customer concerns, and they act on what they hear.

"That bubble up of information has driven more early [marketing] decisions and made us more effective earlier on than I could have ever thought," O'Neill says. "That's been a huge dividend." ▀

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www.computerworld.com

High Performance

MITSUBISHI'S NEW CUSTOMER SERVICE SYSTEM FAR OUTPACES EARLIER MODELS. HERE ARE SOME OF THE IMPROVEMENTS:

THEN	NOW
<ul style="list-style-type: none"> ■ Average of 11 screens per call, pulled up from any of 14 systems. 	<ul style="list-style-type: none"> ■ Single summary screen has information on the customer, contracts, vehicles and service requests. One click provides information for closing 80% of calls.
<ul style="list-style-type: none"> ■ Customer requests copy of lost title. Agent finds paper copy in file, copies it and sends it via U.S. mail. Time elapsed: two days. 	<ul style="list-style-type: none"> ■ Copy is accessed instantly online and sent via return e-mail or fax. Time elapsed: seconds.
<ul style="list-style-type: none"> ■ Customer requests calculation of cost for terminating a lease early. Agent inputs all information, finds various paper records and calculates cost. (Mistakes are possible from accessing wrong information, transposing figures or calculating.) Sends to different department for the appropriate letter and mailing. Time elapsed: two to three days. 	<ul style="list-style-type: none"> ■ Agent asks for only the customer's name and current mileage. All other information is in system. Clicks on "Prepare Worksheet." System grabs appropriate records and calculates instantly. (Virtually no danger of mistaken information or calculations.) Agent provides quotes over the phone, and system faxes material to customer. Time elapsed: a minute.

THE U.S. CONSTRUCTION industry, which accounts for more than 8% of the country's gross domestic product, isn't known for aggressively using technology. Although sectors such as financial services and transportation are riding on the IT fast track, many builders and contractors are sloshing through wet cement.

That's changing, as both contracting and construction management companies embrace Web and wireless technologies to speed projects and cut costs. Driving the change is a growing demand for faster completion of projects with fewer mistakes and, in turn, greater profits.

Some construction companies say Web and wireless tools are providing relatively quick benefits for an industry that has traditionally had narrow profit margins.

Clark Wilson Homes Inc., a home-building company in Austin, Texas, is using both wireless and Web technologies. At a cost of \$250 per worker, the company has deployed Palm Inc. devices equipped with scheduling and note-taking applications from Strata Systems LC, also in Austin. Using the devices, managers overseeing the construction of multiple homes can quickly track progress and pass on instructions to contractors, subcontractors, construction crews and suppliers directly from the work sites. Clark Wilson's total investment in the hardware and application software was less than \$5,000.

Managers and builders using the devices can outline the details of projects in progress, update timelines and collect notes and sketches and then upload data to a Web portal or a desktop computer, from which documents can be faxed. Salespeople can use wireless devices to generate or complete con-

tracts with buyers while in the field.

"We're seeing much greater efficiency, improved scheduling and fewer mistakes in projects" since using the wireless applications, says Hutch White, IT development specialist at Clark Wilson, which builds, decorates, furnishes and landscapes model homes for each project and maintains on-site sales offices. "The more you can reduce cycle time, the more you can profit. If you build four houses [in a given period] instead of two, you can double your profits."

Clark Wilson may expand the deployment of Palm devices in the fourth quarter to its warranty service operators, who would use the devices when inspecting homes to record items that need to be fixed and to e-mail the information immediately to the main office.

Barton Malow Co., a \$1.2 billion provider of construction management, design and general contracting services in Southfield, Mich., is using wireless iPaq devices to let project managers take notes and revise schedules from job sites.

Phil Go, CIO at Barton Malow, says the company wants to use wireless technology to provide Web access from the construction sites and is testing some wireless products for that purpose. "Wireless is still in the early development stages and we are a little concerned about security, but we are committed to using it," he says. "This is because the technology gives workers in the field access to data more quickly and allows them to exchange information with others involved in a building project directly from the site."

For the past 18 months, Barton Malow has been using Web collaboration software hosted by San Francisco-based application service provider Citadon Inc. to connect with contractors, subcontractors, architects and building owners, as well as for project management. Barton Malow operates a portal that is accessible by password to anyone involved in a particular building project. Users can get updates on progress, suggest changes and help solve problems as soon as they arise.

"The biggest advantage to using the Web for project management is that the time it takes to resolve issues is cut significantly," Go says. "Something that used to take weeks now takes two or three days. We get projects completed on schedule and sometimes ahead of schedule."

Wireless is still in the early development stages and we are a little concerned about security.

PHIL GO, CIO AT BARTON MALOW



Interior Architects Inc., an architectural design and facilities management firm in New York, has also reaped benefits from Web initiatives. It used Web collaboration software from Reston, Va.-based Framework Technologies Inc. to create its portal, a platform from which it shares documents and building designs with clients worldwide.

The portal has made it much easier for Interior Architects to work with clients in developing and revising designs or resolving facilities management problems, slashing time and cutting costs from the process, says Peter Frantz, chief technology officer.

"We've cut 25% of the cycle time out of everything we do," Frantz says. "People can make better decisions because they have the [latest] information at their fingertips." He says the portal is available to clients, contractors and suppliers during a project.

Frantz says Interior Architects saved \$7.5 million during a two-year period in which it worked on a series of real estate projects, valued at \$47 million, for a major health care provider. He attributes the savings to time saved in

the design process, improved communication with partners and automation provided by Web applications.

Not every company in the construction industry can expect those kinds of savings, but many of them will look to reap gains by deploying Web, wireless and other technologies. ▀

Violino is a freelance writer in Massapequa Park, N.Y.

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The construction industry takes to the Web – finally. BY BOB VIOLINO

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PHIL GO, CIO at Barton Malow

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BRIEFS

Energy Companies See Big Increase in Cyberattacks

Power and energy companies suffered a disproportionately higher number of aggressive cyberattacks on their information infrastructures in the past six months than companies in other industries, according to a survey of 400 managed security services clients of Riptech Inc., an information security services provider in Alexandria, Va.

According to survey results released today, attacks increased by 23% during the six-month period from January to June, down sharply from a 43% jump during the previous six-month period. But 70% of Riptech's power and energy clients suffered at least one severe attack, up from 56% in the previous six months. Riptech defines attacks as aggressive if they are particularly malicious or represent persistent attempts at opening or exploiting a large range of vulnerabilities against multiple targets.

Riptech said 40% of all attacks originated in the U.S.

Survey: Top Execs Push for Better Project Management

Executive buy-in and support are critical factors for most companies when they implement project management improvement initiatives, according to the findings of a recent survey. The Center for Business Practices in Haverstown, Pa., said that top management, such as directors, vice presidents and chief-level executives, are the primary drivers for recommending project management programs at 62% of the companies surveyed.

Of the 92 respondents, 41% said the most convincing reason for executive buy-in is delivering projects on time and within budget; another 23% cited the need to improve profitability.

Hewlett-Packard, Deloitte Link Up in Software Deal

Hewlett-Packard Co. recently announced an alliance with Deloitte Consulting to jointly develop enterprise software products for customer relationship management and for managing relationships with business partners. The two companies also plan to offer related outsourcing services. The alliance will charge fees based on the performance of the client companies. Fees weren't disclosed.

Knowledge Management Helps Cut Errors by Half

Boston doctors warm up to system that challenges their judgments in prescribing medication to patients

At Partners HealthCare System Inc., which includes some of Boston's most prestigious teaching hospitals, a knowledge management system for physicians has reduced serious medication errors by 55%. John Glaser, CIO at Partners, has been at the helm of this effort for more than a decade, bringing just-in-time knowledge to bear on life-and-death decisions. In this month's Harvard Business Review, he reports on progress and lessons learned with co-author Thomas H. Davenport, director of Accenture Ltd.'s Institute for Strategic Change in Cambridge, Mass. Computerworld's Kathleen Melymuka, who first reported on the project a decade ago, spoke with Glaser recently to get an update about how the system is working.

Going way back, what was the impetus behind the knowledge management initiative?

Two things were at play: We know physicians are human beings and there's too much for them to know. If we could build in help for that decision at the time of decision — where decisions are played out as action — that would have a lot of power.

That thought ran in parallel with a Harvard study that was looking at the rate of medical errors at Brigham [and Women's] and Mass. General [hospitals]. The error rate was just too high, and very simple things were causing a good chunk of the problem — things like not knowing a patient was allergic to a drug or forgetting that two drugs interacted badly.

It seems that the key to this system is that it pushes information to doctors, rather than having them search for it. The general notion is "just in time." The computer knows that you're trying to enter an order. It knows a lot about the patient — test results, other drugs, diagnosis; and [it knows] something about medicine — what goes together. It applies all this and makes a judgment, and about 400 times a day, a physician changes his

mind on an order based on the computer. That's only 3% [of all orders], but it's catching something in the workflow when the physician may not be aware he needs the knowledge.

This is the latest in a series of monthly discussions with authors of articles in the **HARVARD BUSINESS REVIEW** on topics of interest to IT managers.

How readily do doctors accept this unsolicited advice? We were smart in starting with advice on no-brainers: Telling that a patient is allergic to a drug or that two drugs together is a bad combination.

Would they rather we didn't tell them? Of course not. But we didn't go into a class of guidance that is debatable.

How big a factor is the extra time it takes to use the system? The biggest problem is that we're adding 30 minutes to the average 12-hour day. They're working hard already, and they're thinking, "I'm not sure I'm the guy who's making the mistakes. It's probably that other guy." But a while ago a physician pulled me aside and said, "I just want to tell you our system has saved my ass a couple times."

What are the special difficulties in designing a knowledge management system for high-end knowledge workers such as doctors? Physicians don't have a lot of time. They have to sign on, identify the patient, pick the drug and the dose. Getting that to take as little time as possible is non-trivial, particularly with

quick orders like changing a dose. So there was a design challenge in the workflow. Also, this was a system that would challenge their decisions, so it had to be a nonthreatening intervention that can be overridden. Then there was the nature of the infrastructure. Scheduled downtime is not a good idea, because physicians never stop writing orders.

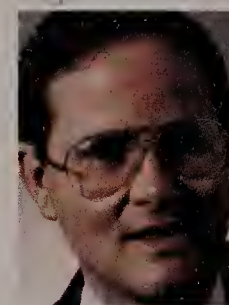
I bet there were nontechnical challenges as well. There were challenges in the medical/legal sense: Are we making our problems worse? If the system doesn't challenge you, is it working? If you overrode and you shouldn't have, would there be trouble? It was complex potential liability territory.

Have the financial benefits justified the costs? People are still debating that. There's not a lot of good study. We have data that says each adverse drug event can cost \$6,000 in additional days you spend in the hospital, additional tests — the true costs to society. But there are goofy economics in health care because we might get paid for those additional days, so it gets complicated. Only about 3% of hospitals have systems like this. That's because it's hard, but also because the ROI is fuzzy and messy. The justification has got to be more on the social-good side than the bottom-line side.

How much of what you've learned is applicable to industries outside of health care?

The world is full of large numbers of knowledge workers whose knowledge is played out in transactions — they order something, document something — and the domains of knowledge they work with are more than they can cram into their heads. And even if they can, they still have lapses, and knowledge is quite volatile so we need ways to help them make better decisions. It might be harder for a lawyer, but it might work for a biochemist looking at a new compound. The computer has knowledge about chemistry and interactions, and it can apply rules behind a

task being done. To the degree that a decision is made and expressed as a transaction, one has the ability to leverage this. ▀



PARTNERS CIO
John Glaser says knowledge workers need more information "than they can cram into their heads. . . so we need ways to help them make better decisions."

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Dear Career Adviser:

I'm considering a career move: switching from software development to quality assurance. What are the skills required for a quality assurance professional? — TESTING 1-2-3

Dear 1-2-3:

This is an unusual strategy because IT testing and quality assurance have been traditionally viewed as stepping-stones into development jobs, and jobs in these fields usually pay less than other positions. However, testing is a very strong component of today's technology economy, particularly if you align yourself with a Fortune 500 company or an application development organization involved in a broader quality initiative.

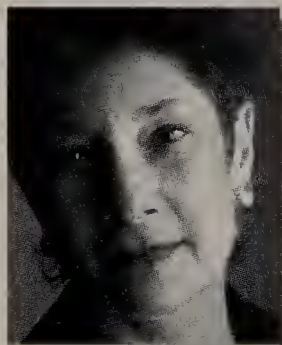
Oracle, for example, has such a strong focus on quality right now that it's building test libraries that ship with its products and can be used by its customers, says Jonathan Rende, vice president of product marketing at Mercury Interactive Corp. in Sunnyvale, Calif., a company widely known in the automated test arena.

You should be prepared to follow a two-pronged approach. First, you'll need to understand testing processes as well as automated test planning, execution, management, predeployment, and functional and regression tools. Second, you must understand how testing and quality assurance relate to bigger quality initiatives such as those developed by Six Sigma Academy Inc. in Scottsdale, Ariz.

You should aim to work at an organization where initiatives such as those are viewed as key to productivity and the bottom line.

Understanding testing, its methodology and its processes could be a good move to differentiate yourself in this economy, says Rende.

Such knowledge will give you an appreciation of what end users expect and will help you show yourself as someone who understands your company's bottom line and what's necessary to make things work as expected.



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Career Adviser:

I have more than five years' experience in systems engineering and network administration. I was laid off on April 1 and am still looking for a job. I've had only four or five calls and two interviews. Is the job market really that bad, or am I doing something wrong?

— LAID OFF IN APRIL

Dear April:

First, remember that in today's market, jobs are best obtained by personal networking, not at job fairs or by answering ads on the Internet. This involves getting in touch with people on your business and

personal contact lists and in your university alumni directory. Second, this job market is a "niche" hiring market in which companies are hiring individuals, not tens or hundreds of people. Getting hired is most often dependent on some type of personal connection, plus a finely-tuned "pitch." And third, you might have to relocate or find a new industry segment that needs your specific IT skills.

"Experienced job seekers are at an advantage in today's job market," says San Francisco-based technology futurist James Canton. "They have seen markets evolve and understand reinventing themselves and selling themselves into new industries and initiatives."

You need to present yourself as someone with specific technical skills that are in demand, such as those having to do with 128-bit encryption, firewalls, biometrics or intelligent architectures. You will also often need to relate those skills to a specific area, such as CRM, data mining, molecular computing, or defense and homeland security. Another strategy is to demonstrate an expertise that can help create future value in a mature enterprise,

such as helping a company monetize its investment in IT applications relating to its core business. "Today, it's all about business," Canton says.

Last but not least, add something to your routine that enlarges your skill

set, gives you a daily schedule and excites you. Even taking a community college course might help keep you fresh and energized enough to persist in today's tougher-than-normal IT job market. ▀

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Software Engineers to analyze, design, develop and implement client server, web appls and OOD appls using Java, C++/C, Java Servlets, XML, HTML, EJB, JSP, CORBA and databases using Oracle, Sybase, Rational Rose etc on Windows NT/95 and Unix OS; train team members and provide user support for the systems and related application both internally and to clients; debug and modify existing software. Require: MS or foreign equiv in CS/ Engg (any branch) or related field with 1 yr exp. Competitive salary, F/T position. Travel to client sites within US. Resume to: Semafor Technologies, Inc, 3300 Holcomb Bridge Rd, Suite 212, Norcross, GA 30092

F/T Programmer: Assist w/ the developing, designing, maintaining, testing & installing company's proprietary software packaging applications as well as various web-based applications w/specific instruction & supervision of Sr. Programmers. Work w/ Oracle, SQL, C++, object oriented programming, JavaScript & Visual Basic. Under supervision design systems & components, test programs & system modules & components to ensure they meet system requirements & trouble shoot any defects found. Must have Bachelor's degree in Computer Science or related field. Educational and/or work background must have included above-referenced skills. Send resume: cchung@ups.com or UPS, Jobcode IASCV. Attn: Carol Chung, HR, R-2A-105A, PO Box 833, Mahwah, NJ 07430

Software Engineer wanted by Noriden Corp. in Piscataway, NJ. Must have a Master's degree in computer science or related fields with at least two years experience. Job duties include designing and developing architecture for online customer application systems using object oriented technology and various software development tools, and developing and implementing high performance applications using various data communication protocols, standards and equipment. Please send resume to www.noriden.com

Express Services Engineer: Provide tech. consulting to cust. & systems integrators to plan, build & deploy Dynamo-driven web applications using Java, C++, SQL, UNIX, Win NT, & object-oriented dev't. Analyze client needs, identify optimal solutions, & support on-site implementation of products. Qualify with MS, Comp. Sci., or related field. Send 2 CVs to: HR, ATG, Inc., 25 First St, Cambridge, MA 02141, an EOE.

SALES MANAGER

Pelco, Closed-circuit TV Manufacturer, located in Clovis, CA is hiring:
Strategic Accounts Manager (Sales Manager)
Job requires travel throughout the U.S.
REQ: Bachelor's degree or equiv. in Bus. Admin., Marketing or related field (in lieu of Bachelor's, will accept 3 yrs exper in job, mktng, or rel.) +5 yrs exper in CCTV & video equip industry, incl. 3 yrs marketing exper w/ customer strategies. Resumes to: Pelco, HR, Attn: Kathy Tucker, 3500 Pelco Way, Clovis, CA 93612 or email to HR@pelco.com. Affirmative Action/EOE.

Software Engineer with complex software systems design and development experience to work in our Burlington, MA office. Send resume to Jay R. Smith Manufacturing Co., 27781 Gunter Park Drive East, Montgomery, AL 36109, Attn: HR Mgr., Req. #SE-02-93-BN03-MO or on-line to mike.polis@jrsmith.com with Req. #SE-02-93-BN03-MO in subject line.

Senior SDK Technical Architect (Atlanta, Georgia)-Team leader responsible for analysis, design, implementation, & testing of complex architecture frameworks for customized enterprise applications integration using Java in J2EE environment as foundation & EJB, JSP, SOAP, XML & XSL for production customization. Must have a Bach. deg. or foreign degree equiv. in Comp. Sci. or related field & 5 yrs of exp. in the job offered or 5 yrs of exp. in a position involving technical architecture development. Experience mentioned may have been obtained concurrently and must include: (i) 3 yrs. exp. in Java; (ii) 2 yrs of exp. each in J2EE, EJB, JSP, XML, & XSL; & (iii) 1 yr of exp each in Enterprise Application Integration, ERP & SOAP. Must have legal authority to work in U.S. Send resume to Angela Beeman (REF:SDK), S1 Corporation, 3500 Lenox Road, Ste. 200, Atlanta, GA 30326.

Software Engineer (St. Louis, MO): will analyze, design, and test various modules of information management system utilizing Logic and Information Network Compiler, (LINC), LINC Design Assistant (LDA), Unisys mainframe Database management system (DMS), Oracle, and SQL; write design specification for changes in the systems and monitor all aspects of development life cycle to ensure standards are followed; and maintain GUI screen using PowerClient utility and Visual Basic. Must have a Bachelor's degree in Comp. Sci., Elect./Electronics Engineering, MIS, Math, or a closely related field plus 2 yrs. exp. in offered position or in a closely related occupation such as Programmer Analyst or Software Developer. \$62,200/yr; 40 hr/wk; Mon.-Fri., 8:00am-5:00pm. Respondents must be presently authorized for permanent employment in U.S. Resume to: Mrs. Myra Huhmann, Division of Workforce Development, Employer Relation (450-0050), P.O. Box 1087, Jefferson City, MO 65102-1087 Re: Job#0316269. An employer **paid AD**

Seeking qualified applicants for the following positions in Memphis, TN: Senior Technical Analyst. Research, evaluate, implement and coordinate changes to large, complex computer systems/applications. Requirements: Bachelor's degree* in computer science, math or related field plus 5 years of experience in systems development, including programming. Experience with: either C, C++ or Java; Tibco; and messaging also required. Manager Project/Process (IT). Manage software development life cycle (SDLC) process for major analytical pricing projects and/or processes requiring involvement of user area and systems development. Requirements: Bachelor's degree* in business, computer science or related field plus 5 years of progressive experience in systems development and/or operations analysis. Experience with analytical pricing project management; mainframe systems /software (IMS or CMS); and SQL also required. *Master's degree in appropriate field will offset 2 years of general experience. Indicate which position you are applying for and submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

SR. WAN/LAN ENGINEER wanted by comp. consulting firm in Sugar Land, TX. Need degree & exp. Respond by resume only to: Ms. E. Nelson, Recruiter W/C #10, Digital Consulting & Software Services, One Sugar Creek Center Blvd., Ste 500, Sugar Land, TX 77478.

Princeton computer consulting firm needs software developer to design and develop business and financial applications using Visual Basic, Oracle, MSL-SQL Server, Sybase, ASP, ActiveX, COM/DCOM, Crystal Reports, S-Designer and Visual Interdev in Windows NT/98/2000 environments. Must have B.S. in Comp. Sci., Engg., Math, Physics or related discipline plus 5 yrs. relevant exp. Reply to: S. Nemani, 4365 Rt. 1 South, Princeton, NJ 08540.

Sr Systems Analysts to analyze, design, develop, test, implement, maintain complex commercial systems and custom client/server business applications; provide expertise in software methodologies & project management to implement projects; design, develop configuration management systems using COBOL, JCL, CICS, VB, Xpeditor, File-Aid, and SQL; interact with users to document system requirements; create stored procedures and triggers. Requires: Master's degree or foreign equiv in CS/ Bus. Admin./Engg (any branch) /related field with 1 yr exp. Highly competitive salary. Some travel involved. F/T position. Resume to: Cosyne Enterprises Inc., 3505 Koger Boulevard, Suite 130, Duluth, GA 30096

Software Engineers, Dallas, TX.

Java, EJB & WebLogic server, web development; HTML, Java Script, & Oracle or MS SQL Server, Unix &/or Windows NT & XML. BS in comp. sci & 2 yrs exp. in development. Must be authorized to work permanently in US. Fax resume: J. Scott @Viewlocity, 404-267-6503.

Multiple positions-Software Engineer wanted w/BS & 2 yrs. Exp. in Houston, TX. Send resume to: HR Dept., Scicom Americas, Inc., 1500 S. Dairy Ashford, Ste 241, Houston, TX 77077.

Schoile Corporation located in Elmhurst, IL requires Systems Analyst to develop, test & implement systems in packaging industry using Visual Basic & XML. Requires BS Computer Sci, Engineering or related field + 4yrs exp. Respond to: C. Ther, Scholle Corp., Ste 300, 360W. Butterfield Road, Elmhurst, IL 60126.

Software Engineer (Atlanta, GA): Design & implement electronic billing presentment & components for CRM account management website in multi-tiered & distributed environment. Design & implement secure FTP transmission systems. Work w/ Java, Siebel CRM, PERL, C/C++; including Java script, Weblogic, ANT, JBuilder, CGI, JSP, ASP, VB, VB Script, Oracle, SQL & HTML. Req. Bachelor's or its foreign degree equivalent in C. Sc. or other engineering field + 2yr. exp. in job offered. Resume to: Human Resources; job code CWDB78, Cbeyond Communications, 320 Interstate North Pkwy, SE, Ste 300, Atlanta, GA 30339

Project Managers to manage/lead technical teams to perform application analysis, design, development utilizing component based application development of OLTP systems in client/server, data warehouse/data mart, logical/physical data process and object modeling using UML, GoF Design Patterns, Oracle RDBMS, EJB, XML/XSL, C/JAVA, HTML, COBOL on Windows and UNIX OS; write software requirements & design specifications; develop project budgets, time and cost estimation, etc; motivate, tutor team members and evaluate performance. Require: MS in CS/Engg (any branch) or related field with 3 yrs exp. A BS or foreign equiv in CS/Science/Math or Engg (any branch) with 5 yrs of relevant progressive exp will also be accepted. Competitive salary. F/T position. Some travel involved. Resume to: HR, Bahwan Cybernet Technologies, Inc., 209 West Central St., Suite 312, Natick, MA 01760.

Thomson Financial Inc. seeks a Database Administrator (Boston, MA) to provide comprehensive DB admin. services to implement Oracle & Sybase DBs for Sun Solaris/HP-UX & NT OS; support development for JDBS & SQLJ; & use WebDB for production support & devel. Min. requirements: Master's degree or equiv. in Computer Sci., any Engineering area or related field, + 5 years of exper. as DB Administrator working in Oracle & Sun Solaris envir.; exper. must incl. 3 yrs of JDBS, SQLJ & WebDB (aka Oracle Portal) in the Sybase/HP-UX/NT envir. Pls respond to: Nicole White, HR, Thomson Financial, 22 Thomson Place, Boston, MA 02210.

Programmer Analyst: Analyzes user requirements procedures, and problems to automate processing or to improve existing computer systems. Bachelor in Computer Science, Engineering or math-related and 2 yrs. of IBM Mainframes, MVS, CICS, MF Revolve, AS/400, RPG/400, DB2/400, CL/400 experience required. \$57,450 yr. Apply by resume only to William T. Wiley, Sr., Vice President, Y.K.K. (U.S.A), Inc. 1306 Cobb Industrial Drive, Marietta, Georgia 30066.

Programmer needed to design, develop and test software primarily using LISP. Requires a Bachelor's degree in Computer Science, Electrical Engineering or related field. Send resume to Nancy Adams, Elliott Wave International, 200 Main St., Hunt Tower, Gainesville, GA 30501

SeeBeyond, the leading global provider of eBusiness Integration Solutions has the following job opportunities available:

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Bachelors degree or equivalent work experience.
Fax resume to: (626) 408-3381, Attn: GC-BSA. EOE.

Database Administrator, Newark, NJ - Requires Master's Degree. Please send resume to: Paul Besso, Ciber, Inc., 5251 DTC Parkway, Ste. 1400, Greenwood Village, CO 80111.

Software Engineers to analyze, develop, maintain client server web apps and DW apps using Java, HTML, DHTML, C/C++, Javascript, VBScript, Servlets, JSP, DW tools etc under Windows and UNIX OS; perform DB monitoring using Oracle, DBASE, SQL Server, Developer 2000 and quality control, coding and testing of projects; generate batch reports from existing data and debug for better performance. Requires: MS or foreign equiv in CS or Engg (any branch) with 1 yr exp. Competitive salary. Travel involved. F/T position. Resume to: Smartsoft International, Inc., 4898 South Old Peachtree Road, Suite 200, Norcross, GA 30071

Director, University and Regional IT Services

The University seeks the senior manager for a state-of-the-art centralized computing and networking services center. The data center is a multipurpose facility that operates 24/7/365 interfacing with and serving all academic, administrative and business units in a large research extensive university as well as a number of other regional and statewide programs and clients.

For more information and application procedures, please visit www.it.ufl.edu. Formal review of applications will begin on September 15, 2002 and will continue until the position is filled. Salary negotiable. If an accommodation due to a disability is needed in order to apply for this position, please call (352) 392-4621 or TDD (800) 955-8771. AA/EAA/EEEO

Information Technology Manager, Insurance Claims Admin. Min. Bachelor's in Engineering/related field or equiv., MBA. Oversee all IT operations, using knowledge of SQL, Pyramid, Seagate Crystal Report, VPN, Firewall. Manage databases, streamline operations, review data and prepare management reports to maximize business operations. 40 hrs/wk. 9AM-6PM. Competitive salary. Send resume to: Fleming & Hall Administrators, ATTN: HR, PO Box 767668, Roswell, GA 30076.

Sr. Software Dvlpr wanted by Healthcare Mktg Communications Co in Manh. Design & dvlp software; generate software & web-based designs; write flowcharts & program descriptions. BS in Comp Sci or Sys Engr & 2yrs exp in job offered req. Respond to: SS/HR Dept, PO Box 4241, GCS, NY 10163.

JOB OPPORTUNITY:
Computer Programmer
Job location: San Jose, CA. Duties: Convert data from project spec's & statements of problems & procedures to detailed, logical flowcharts for coding into computer language. Create & modify C/C++, K-Script, and SAS programs of a complex nature. Develop & write programs to store, locate & retrieve specific documents, data & info from multiple databases. Test & debug C/C++, K-Script, & SAS programs. Code, test & implement databases. Use Adobe Photoshop to design & create custom graphics. Hand code HTML in conjunction w/ Dreamweaver to create & maintain web page. Develop & maintain CSS, HTML, JSP & XML code for web applications. Req's: Bachelor's in Electrical Engineering + 2 yrs. exp. in job offered. Exp. which may have been obtained concurrently, must include: 1 yr. exp. designing & hand coding HTML pages for websites, 1 yr. exp. coding XML for web applications & 1 yr. exp. using Adobe Photoshop & Dreamweaver. To apply, mail resume to: Ms. Debbie Gardner Tossie, Knowledge Decision Sciences, Inc., 211 W. Franklin St., Monterey, CA 93940.

Codesic seeks Unix Sys. Admin. for Kirkland, WA HQ office. DESC: Admin. & maint. UNIX sys. Anlyz info. sys, id client reqs, & rec. hardware & s/w solns. Install & config. app. & web servers, RDBMS, & progs. util. C++, Java, shell script, Perl, & HTML. Mng. & config. disc storage. Set up user accts, mng. password resets, & conduct capacity planning & perf. tuning. Anlyz, troubleshoot & deploy sys. apps. Prep training & troubleshooting guides. Conduct root cause analysis to explain & prevent sys. & app. failures. REQ: BS in Engr, CS, Math, or Phys. plus 1 yr exp. admin. & maint. Unix sys. Install & config. app. & web servers, RDBMS & progs. util. C++, Java, shell script, Perl & HTML. Mng. & config. disc storage. Mng. user accts, password resets, & conduct capacity planning & perf. tuning. Anlyz, troubleshoot, & deploy sys. apps. to meet bus. obj. Prem. sal + benes & bns. Pls reply to Tech. Rec. Job #CO-103, 11250 Kirkland Wy, Ste 101, Kirkland, WA 98033.

DBAs to design, develop and manage mission critical data ware house databases and performance tuned Oracle production databases; analyze, design, develop, test and implement online transaction processing and multi user systems involving large and distributed databases; perform database creation, modeling, calculation of object sizes, table spaces and database sizes; provide performance improvement, optimization, upgrade and migration. Require: M.S. or foreign equiv in CS/Engg. (any branch)/related field with 1 yr exp. Highly competitive salary, F/T position. Travel involved to client sites. Resumes to Compsoft Technology Solutions, Inc, 11 N Roselle Rd, Schaumburg, IL 60194

Technosoft Corporation has multiple opening for Programmer/Analyst, Software Engineer, Project Lead/Manager. Applicant should have strong skills in Java, Perl, Siebel, Oracle/Informix DBA, GUI, Java C++, CRM Applications, ERP & Dataware- warehousing. Send resume to: 3071 Lawrence Expressway, Santa Clara, CA 95051 or email to: jobs@technosoft-corp.com

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Senior Vice President and Chief Information Officer for the Walt Disney World Resort, will be the Keynote Speaker for the Awards Banquet, Saturday, August 10, 2002

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Analyst (network systems & data communications) - perform analysis, design, testing, evaluation etc. of LAN/WAN & other systems. Research & recommend proper hard/software to users. Maintain, troubleshoot & assist users w/ programs & implementations. Resolve technical issues. Coordinate overseas offices w/ user requirements, design, develop & solutions. Requires: BS-Computer Science (or equivalent); Microsoft Technologies Certification; 2yrs exp in computer software solution development. \$36K/yr (40hrs/wk). Apply with CV to: Sri Vepa, Systems Hardware Inc. 661 Brea Canyon Road, Suite 5 Walnut, CA 91789

Prog/Analysts to analyze, design and develop Peoplesoft HR and Payroll Systems using Peoplesoft, Oracle, Developer 2000, VB, MS Access, PL/SQL etc on UNIX and Windows OS; support and maintain customized software packages; debug and modify existing software; prepare documentation. Require: BS or oreign equiv in CS/Engg (any branch) / related field with 2 yrs exp. S/W Engineers to analyze, design, develop and implement apps using Java, C++/C, JSP, EJB, Servlets, HTML, XML, Websphere, VB, PB, Oracle, SQL Server on UNIX and Windows platforms; perform unit and integration testing, performance tuning and query optimization; provide customer support; perform requirements study and provide feedback; create triggers and data bases design; debug and troubleshoot. Require: MS or foreign equiv in CS/Engg (any branch) with 6 months exp. Highly competitive salaries, F/T positions. Travel involved. Resumes to Compsoft Technology Solutions Group, Inc., 11 N Roselle Road, Schaumburg, IL 60194

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- **PROGRAMMERS/ANALYST:** (code: AP/1). Req. 1+ yrs. exp.
- **SR. ANALYST/PROGRAMMERS:** (code: SP/2). Req. 3-5+ yrs. exp. in IT industry in advance programming & system analysis.
- **TEAM LEADERS:** (code: TL). Req. 5+ years exp. in leading large project teams.

All positions req. BS/MS in CS or related field and proficiency in one or more of the following: **Language:** COBOL, CICS, Assembler, LINC, XML, C++, Perl, and PL1, Java. **Platform:** IBM mainframe, Unisys mainframes, Unix, NT. **Database:** Oracle, Informix, DB2, Progress, TMS, MS SQL server. **Front-end:** Developer 2000, VC++, Power Builder, and VB. **Web Technologies:** WebSphere, Weblogic, ASP, IIS, MQ series, Tuxedo. **Case Tools:** Designer 2000, ERWIN, UML, Rational Rose and any other case tool. **Network Technologies:** LAN/WAN, TCP/IP, routers, switches, gateway, firewall. **Support:** System maintenance, break fix maintenance, network administration and support.

Position openings are at several locations nationwide and the selected person could be offered posting at any of the company's project sites in the US. The job may require substantial traveling and may require relocation. TATA INFOTECH is an equal opportunity employer. E-mail your resume, mentioning the position code in the subject line, to: jobs.us@tatainfotech.com



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SAP Systems Analyst needed for Consulting and Information Company in Alpharetta, GA. Job duties include: Utilizing business and technical expertise in systems application and products in data processing (SAP); analyzing user requirements, procedures and problem to automate processing, or to improve existing computer SAP systems; and planning, designing and implementing an integrated family of sales, marketing, and customer service applications. Applicant must have Masters in Business Administration, Computer Science or Engineering, plu 3 yrs. of exp. in SAP FI/CO modules and at least 2 yrs exp in oil and gas modules. 8:00 am to 5:00 pm Monday-Friday. \$102,000 per year. Send 2 resume and cover letter to Heather Arnold, B2B Workforce, Inc. 11625 Rainwater Drive, Suite 340, Alpharetta, GA 30004

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Who we are

GE Power Systems is the world's leading supplier of power systems equipment and services with global annual sales of over \$14 billion. Our innovative team spirit and progressive challenges have made GE Power Systems an environment offering exceptional opportunities.

Who we seek

Digitization Black Belt Opportunities in Schenectady, NY and Atlanta, GA.

The Digitization Black Belt will support the General Manager, functional managers and the Master Black Belt in achieving departmental digitization goals including, but not limited to new projects and cost savings. The Black Belt will implement and drive digitization projects using Six-Sigma methodology, as well as lead cross-functional teams in application of Six-Sigma and CAP methods to digitize key processes. The Black Belt will coach individuals and teams in the use of digitization tools and the application of Six-Sigma tools.

We require a BS degree in Engineering or technical equivalent; a minimum of 2 years experience leading cross-functional team and project/program management; strong quantitative and analytical skills; strong interpersonal communication, facilitation and computer skills.

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GE Power Systems

Group Leader, Bioinformatics

GENAISANCE PHARMACEUTICALS, INC. has an immediate opening in its New Haven, Connecticut office for the position of Group Leader, Bioinformatics.

Responsible for leading and performing various research, design, coding and testing assignments in the development of computer systems and the managing of human and hardware resources. Performs gene and sequence analysis process and analyzes software requirements from the scientific users to determine feasibility of design within time and cost constraints.

Must possess a Ph.D. in Computer Science or a related field and relevant experience with the genomics industry, including the gene and sequence analysis process and tools and their development; object-oriented programming in Java and Relational Database Management Systems in an Oracle Relational Database engine; mathematical concepts, such as probability, statistical inference, algorithm proofs, fractions, percentages, ratios and proportions, statistics and probability theory and machine learning techniques.

Resume and/or cover letter must reflect each requirement above and specify reference code GLB or it will be rejected.

Forward resume to Jennifer Barrett, Human Resources Manager, Genaisance Pharmaceuticals, Inc. at 5 Science Park, New Haven, CT 06511 EOE.

Programmer Analyst. Analyze, develop, test, and maintain business applications. Develop Applications in Java, XML and C/C++ using Enterprise Java Beans (EJB) and the corporate object model described using the Unified Modeling Language (UML) standard. Utilize Oracle (Pro*C, PL/SQL, Oracle Designer, Developer and Forms 2000 or higher and DB triggers/packages), Unix shell programming and systems job control processing. Perform configuration management using a tool such as Software Development Life Cycle (SDLC), PVCS or MKS. Develop systems that allow for data exchange/transfer between multiple language applications using double-byte character management with Oracle's UTF-8 protocol. Salary \$34.55 per hour, 40 hours per week. Must have B.S. or B.E. Degree in Computer Science or Engineering and three years programming experience. Programming experience/knowledge/ability in C/C++, Java, Oracle tools (Pro*C, PL/SQL, Designer and Forms 2000 or higher, DB triggers and packages), Unix shell programming, systems job control processing and relational database concepts XML, development of information exchange/data transfer system and double-byte character management, and software development life cycles. Send resume to Department of Workforce Services, ATTN: Pat Redington, Job Order #3061539, 140 East 300 South, Salt Lake City, UT 84111

Software Engineer, IT Business Solutions. RCM Technologies is a full-service software development and computer consulting firm dedicated to providing businesses with progressive IT solutions. We are looking for an individual to analyze, design, develop, and test software applications for many projects in a variety of industries. Experience must include AIX, RS 6000, DB2, Korn Scripting and SQL Scripting. Req: MS w/ 1 yr exp in the field or BS w/ 5 yrs. exp. We offer competitive salaries and benefits. Please mail or fax resume to: RCM, 2540 North First St., Ste. 201, San Jose, CA 95131. Fax (408) 955-9015, ATTN: HR.

Software Design Engineer -

Waukesha, Wisconsin Analyzes, designs, develops, implements, tests, documents and supports software systems for global manufacturer of medical diagnostic imaging equipment. Works within cross-functional teams to deliver high-quality medical imaging systems for one or more modalities, such as Positron Emission Tomography (PET), Magnetic Resonance (MR), Computed Tomography (CT), Ultrasound, X-ray and patient monitoring. Utilizes and incorporates Six Sigma methodology into the engineering works. Responsibilities include one or more of the following depending on the needs of the company at the particular time: designs and develops firmware for detector or gantry electronics to acquire/condition signals and to diagnose hardware problems; designs and performs component and system level testing and verifications; specifies, prototypes and tests commercial off-the-shelf electronic solutions for data acquisition systems; designs and develops real time software for subsystem(s) and/or host software; analyzes software and resolves issues which come up during validations or from the field. Required is a Bachelor of Science degree in Computer Science or Electrical, Computer or Biomedical Engineering and one (1) year of experience in the position being offered or one (1) year of experience as Graduate Research Assistant. As part of the required experience in the position being offered or in the related occupation, the applicant must have had experience in designing, specifying and testing electronic systems; had experience working with complex electromechanical systems; had experience with real time operating system; had experience with C/C++ programming language. Monday through Friday; 8:00 am to 5:00 pm; 40 hours per week; \$58,000 annually. Qualified applicants may submit two (2) copies of resume and cover letter to: Mike Brooks, DWE-FLC, P.O. Box 7972, Madison, Wisconsin 53707-7972. Please reference case number C102105.

SENIOR SOFTWARE ENGINEER to lead a team in the design, development, configuration, testing, implementation and conversion of legacy software systems in a client/server environment using COBOL, CICS, DB2, Natural, Adabas, VSAM and JCL; Mentor junior programmers and engineers. Require: Bachelor's degree in Computer Science, an Engineering discipline, or a closely related field with five years of progressively responsible experience in the job offered or as Programmer/Analyst or Programmer. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Ravi Kandimalla, President, Everest Computers Inc., 900 Old Roswell Lakes Parkway, Suite 300, Roswell, GA 30076; Attn: Job UK.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain financial applications and call center applications in a client/server environment using object oriented programming, Oracle, C, C++, YACC++, Pro*C, C ISAM, Java, JDBC, Servlets and Java Beans, as well as TCP/IP, SNA and ISO standard protocols under UNIX, SUN Solaris and AIX operating systems. Require: B.S. degree in Computer Science/Engineering, or a closely related field with two years of experience in the job offered or as a Systems Analyst. Competitive salary offered. Send resume to: Debra L. Crow, Citibank Universal Card Services, 8787 Baypine Road, Jacksonville, FL 32256; Attn: Job GJ.

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Financial meltdowns underscore need for greater CIO/CFO checks and balances

BY THOMAS HOFFMAN

The accounting scandals that have rocked Enron Corp. and WorldCom Inc. have implications for CIOs well beyond their individual stock portfolios. Some executives are beginning to question the checks and balances that exist between CIOs, who are the custodians of operational and financial information, and chief financial officers, who manage the company jewels.

Few CIOs say they feel responsible for how financial information is recorded, since those responsibilities typically fall to the finance organization and the auditors who validate the data. CIOs "shouldn't be looked at as the information police or the information quality police," said Eileen Strider, president of Strider & Cline Inc., a Kansas City, Mo.-based consultant and former CIO at Universal Underwriters Insurance Co. in Overland Park, Kan. "You're looked upon to provide information but not dictating to people how they use it."

Still, some CIOs and industry experts hold that the current financial maelstrom should be a wake-up call for IT managers to become more proactive in delivering operational information to senior management more frequently to ensure faster and more accurate decision-making.

For chief-level executives, "there's an imperative responsibility that the right types of information are delivered to the peer group to make the right decisions," said Keith Bearden, chief of information at A-dec Inc., a Newberg, Ore.-based maker of dental products. A "lack of information typically leads to a lack of

decisions," Bearden added.

That's one of the reasons why Gartner Inc. is devoting a growing amount of research to an area it calls the real-time enterprise. CIOs should — but rarely do — deliver vital information to CEOs and board-level officers continuously, said Ken McGee, a group vice president and research fellow at the Stamford, Conn.-based research firm.

"If you provide the captain of a ship real-time GPS [position data] and other information, it will help them deter-

mine if a change in course is required," said McGee.

McGee contends that there are few if any companies doing an effective job of delivering real-time operational and financial information to executives, since most IT managers have focused on a back-office, service approach.

At least one CIO in the financial services industry takes exception to those charges. "For years, [brokerages] have been getting real-time information to senior management to help them minimize" investment risks, said Russ Lewis, executive vice president and CIO at GFInet Inc., an online trading firm in New York. Delivering real-time information

to senior management "is nothing new for us" on Wall Street, he said.

Part of the problem, as Strider describes it, is that the CIO often reports to the CFO, which can make it challenging for companies to validate the integrity of financial information between the CIOs who are tasked with guarding the information and CFOs who have unlimited access to it.

For his part, Bearden maintains that there should be more of a peer relationship between CIOs and CFOs as well as greater checks and balances between the two. "I don't know if it'll truly raise the CIO position to a true peer," but such an approach could help some companies establish independent reporting mechanisms to ensure the integrity of operational data, he added. ▀

Data Integrity

Some tips from CIOs about identifying and reporting the misuse of information:

ENSURE that you have a seat at the executive table and that senior management is willing to listen to reported irregularities.

VALIDATE who has access to critical data on a regular basis.

FAMILIARIZE yourself with ways technology can be used and abused throughout your organization for criminal gain.

EDUCATE yourself on the ground rules your organization uses to capitalize expenses.

MAKE SURE an independent organization not under the purview of finance exists to audit financial and operational data.

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WorldCom

Such transition costs are particularly fresh in the minds of federal officials. In January 1999, WorldCom won a four-year contract to provide telecommunications services for the U.S. government, with options that could extend the deal up to eight years. That multibillion-dollar agreement accompanied one that had been signed earlier with Sprint Corp., thus giving the federal government two telecommunications providers.

The move to new providers was on a scale equal to that of "25 Fortune 500-size organizations," testified one federal official last year before a congressional committee. The government created a \$98 million transition fund, and it took many agencies more than a year to complete the switch.

For the Defense Department, the change in providers meant physically replacing components from the previous

Feds Rely on WorldCom

The U.S. government paid WorldCom \$462 million in its last fiscal year for comprehensive communications services to agencies, including the Social Security Administration and the departments of Justice, Transportation and Energy. Specific services for other agencies and government operations include the following:

Department of Defense: Command and control network

Federal Aviation Administration: Communications infrastructure for air traffic control system

U.S. House of Representatives: Wide-area frame-relay service

U.S. Postal Service: Managed network services

vendor, AT&T Corp., as well as coordinating every circuit transition with the old and new vendors, local exchange carrier and end users. It completed that work last year.

The transition cost can be

onerous for the private sector as well. Switching to a new provider can involve installing new equipment and access lines. According to analysts, that transition cost can equal up to 25% of the cost of the first year's contract, depending on service levels.

Moreover, contracts typically run two to three years, meaning that users can't easily switch providers without paying a penalty for early exit, said analysts.

"The idea that companies can and are going to just leave WorldCom wholesale just isn't going to happen," said Eric Paulak, an analyst at Gartner Inc. in Stamford, Conn.

WorldCom's financial problems erupted suddenly, but the effects of those problems — large layoffs and the threat of bankruptcy — will likely be gradual. In the weeks ahead, rival vendors could begin offering deals to cover some or all of the switching costs, said Tom Jenkins, an analyst at TeleChoice Inc. in Tulsa, Okla. Analysts will also be watching for requests for propo-

sals from large user firms.

Sprint spokesman John M. Polivka said his company has been receiving inquiries from federal agencies that currently use WorldCom. "We've had a large increase in the number of inquiries coming in, and it's chiefly from folks doing contingency planning," he said.


But, Polivka said, "I do think they are going to come out of this. What's shaken is customer confidence. They are a viable company. It's not like they're a dot-com wonder."

The first congressional hearing on WorldCom is scheduled to begin today. Sidgmore, who took over as CEO two months ago, is promising full cooperation.

"We want the bad guys punished," he said. "And we want to move on with our lives at WorldCom." ▀

UNDER REVIEW

The U.S. Defense Information Systems Agency is reviewing its WorldCom contracts to see if they will be affected by the carrier's financial restatements.

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FRANK HAYES/FRANKLY SPEAKING

License to Hack

THERE ARE BAD IDEAS, and then there are really *awful* ideas. Example of a bad idea: the proposed uniform state law called the Uniform Computer Information Transactions Act (UCITA), with its “self-help” provision that lets vendors remotely sabotage software you’ve bought if they believe you’re not conforming to their license terms. That one is such a stinker that three states have actually *outlawed* UCITA provisions from being enforced.

And a really awful idea? Try legalizing malicious hacking.

That’s what a Los Angeles congressman named Howard Berman has in mind. He’s proposing a federal law that would let copyright holders use “technological self-help measures” against peer-to-peer networks like Kazaa, Morphueus and the now-moribund Napster in order to fight piracy of their copyrighted material.

What kind of “self-help” would be legalized? Spoofs, redirection, file blocking, decoys, interdiction and, oh yeah, actually breaking into servers to plant malicious code.

And what if a copyright holder causes additional damage or attacks the systems of someone who isn’t actually misusing their copyrights? Berman’s bill would protect them from being arrested or sued.

Now let this sink in for a moment: This law is a license to hack, and hack maliciously — without any further government approval, without a court order, entirely at the discretion of the copyright holder.

This is a terrible idea. Full disclosure: I’ve got no use for peer-to-peer networks where music and movies and software are pirated. My own copyrighted work has been ripped off on the Internet. My friends include the owners of several tiny music labels who hate the music-stealing networks with a passion and rejoiced when Napster went down. So I’m in a position to benefit from this license to hack.

But I repeat: It’s a truly awful idea. And not just because it would give a little moral justification to every overgrown juvenile delinquent who believes that “if it’s OK for big movie studios to break into someone else’s computer, then it’s OK for me, too.”

It’s also a bad law for us because even though it’s aimed at peer-to-peer outfits like Kazaa and Mor-

pheus, the next target will be corporate IT.

Face it, there’s no way to write a law that’s sure to include all peer-to-peer pirates without defining things very broadly. So any copyright holder who’s got a beef with any organization whose networks may be used to violate copyrights could claim this license to hack.

So if some software vendor decides your company might have unlicensed software on its network — *whether that’s true or not* — the vendor could break into your servers and rummage around. After all, the software vendor is a copyright holder, and that server is on a network.

Sound crazy? Remember, Berman’s idea is to leave this all to the discretion of the copyright holder. And some copyright holders are notorious for believing their rights extend far beyond what any court or lawmaker has ever approved. For software makers who want to have you in a hammerlock, this is like UCITA on steroids.

And what if a competitor suspects you’ve acquired some of its copyrighted proprietary information? (Remember, the suspicion doesn’t have to be true.) Does anyone think some companies wouldn’t jump at the chance to hack into their rivals’ networks legally, no matter how flimsy the pretext, and “self-help” themselves to whatever they can find?

Berman says copyright holders are at a disadvantage against peer-to-peer pirates. That’s absolutely true. Crooks always have an advantage — they don’t obey the law.

But the legal system shut down Napster for copyright infringement. That’s the way to go after other peer-to-peer pirates too.

There are already too many malicious hackers out there threatening our systems. Making any kind of electronic sabotage legal is a really, really awful idea. ▀



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SHARK TANK

BACK IN THE days of 5.25-in. floppies, user calls support pilot fish for help. “I inserted the first floppy and typed ‘Setup,’” she says. Good, fish tells her. “Then I inserted the second floppy.” OK, says fish. And then? “Then,” says user, “the third floppy just wouldn’t fit.”

“I’M LOSING e-mail messages,” new user tells support pilot fish. You need to give me a little more information, says fish. “After I type up a message and enter an address, I hit the Send button,” user says. “And my message disappears.”

AFTER A fruitless hour spent trying to get into the company’s dial-up server, user calls e-mail admin pilot fish for help. Fish walks him through the normal procedure until he hits the error. “What does the dialog box say the error is?” fish asks. Answers user, “No dial tone.”

CAN YOU help me print raffle tickets for my church? user asks tech-support pilot fish. Fish finds user a Web site that offers a trial download of ticket-printing software. User has one more question: “Does the download include

the special paper needed for the tickets?”

TRYING TO reduce systems administration costs, IT director pilot fish asks office admin to back up the server every day. Not too many days later, admin comes to fish with a complaint: “The server is now up against the wall and can’t go back any farther!”

USER DROPS by e-mail admin pilot fish’s office to report that he’s not receiving e-mail. So fish sends him a test message. And receives a reply e-mail message from the user: “Call me; still not receiving e-mail.”

IT’S THE third call today from a computer training specialist trying to install software on her workstation. “It says on the screen, ‘Press any key,’” she tells support pilot fish. “What do I do now?”

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